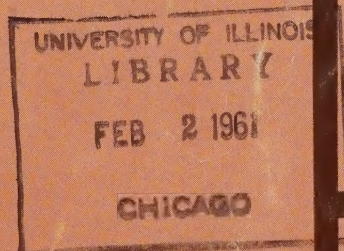


January, 1961

Management  
and



# BUSINESS AUTOMATION



*Industry Experts Explore  
'Business Tomorrows'*

*page 18*

*A New Computer at Johnson's Wax*

*page 24*



# Why Offset Paper Masters by Xerography?

## What's xerography?

A dry, clean, fast, electrostatic copying process that economically prepares offset paper masters for duplicating. You can enlarge, reduce, or copy size to size. Original may be anything written, printed, typed, or drawn. Equipment used is called XeroX<sup>®</sup> copying equipment, made by Haloid Xerox Inc.

## Is XeroX copying equipment easy to operate?

Yes. Three simple steps: exposure, dry processing, and dry transfer. Within a few minutes anyone can learn the operation. No original is too hard to handle. There are no critical exposures or temperatures; therefore, waste of materials from wrong exposures is negligible—almost impossible.

## How about quality?

Superb. Often it's hard to tell copies from the original. That's why many office-service and engineering-reproduction departments use XeroX copying equipment exclusively for the preparation daily of hundreds of offset paper masters.

## Can a copy ever be better than the original?

Yes. Copies of dog-eared and cracked engineering drawings, carbons of bills of lading often look far better than the originals when the masters are prepared by xerography.

## What about costs?

Costs are surprisingly low. There are many reasons: xerographic materials cost only a few pennies per master. No special offset paper masters are required and none are wasted. Operator's time is lower because there are no critical adjustments for exposures. The more you need offset paper masters, the more you'll save by xerography over any other method.

Equipment available on low monthly rental, purchase, or metered cost per copy plan designed especially for low volume users.

## No wet chemicals?

None whatever. No peel-apart either. And, of

course, there's no changing of chemicals—no "KP" for an office girl at today's higher salaries.

## How about length of runs?

You get much longer runs from masters prepared by xerography. Because of their durability, xerographic images do not break down from wet chemicals, thus last longer, and produce much lengthier runs—5,000 and 10,000 copies are not uncommon.

## Do masters have to be "hardened" after preparation by xerography?

No. They are ready immediately for the duplicator and, unlike photographically prepared masters, they don't require remoistening to prevent fill-in if the machine stops during the run.

## Any need of a darkroom?

None. XeroX copying equipment is operated in full roomlight.

## Will XeroX copying equipment make other types of duplicating masters?

Yes, xerography is the world's most versatile copying process. XeroX copying equipment also prepares translucencies for diazo-type duplicators, spirit masters for spirit duplicators, and metallic masters for offset duplicators.

## Who uses xerography?

Most of the best known companies in America and Canada—and nearly all government agencies where duplicating is required.

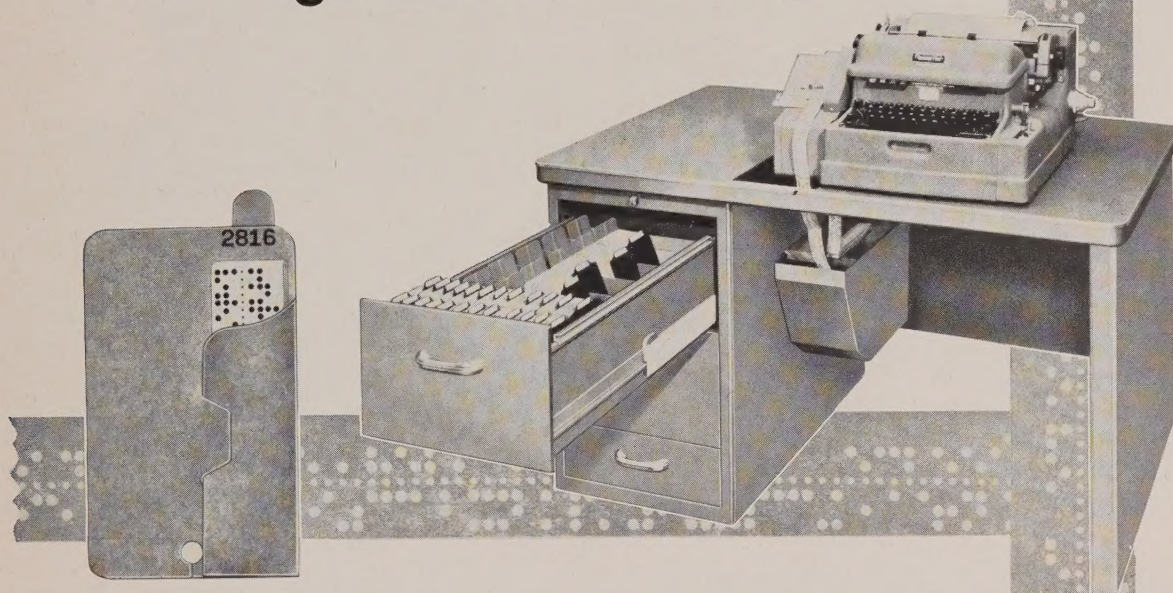
## Where can I find out more about xerography and offset duplicating?

Write today for our XeroX copying equipment brochure. It shows you how to speed paperwork duplicating and save thousands of dollars yearly by xerography. Haloid Xerox Inc., 61-174X Haloid St., Rochester 3, N. Y. Branch offices in principal U. S. and Canadian cities. Overseas: Rank-Xerox Ltd., London.

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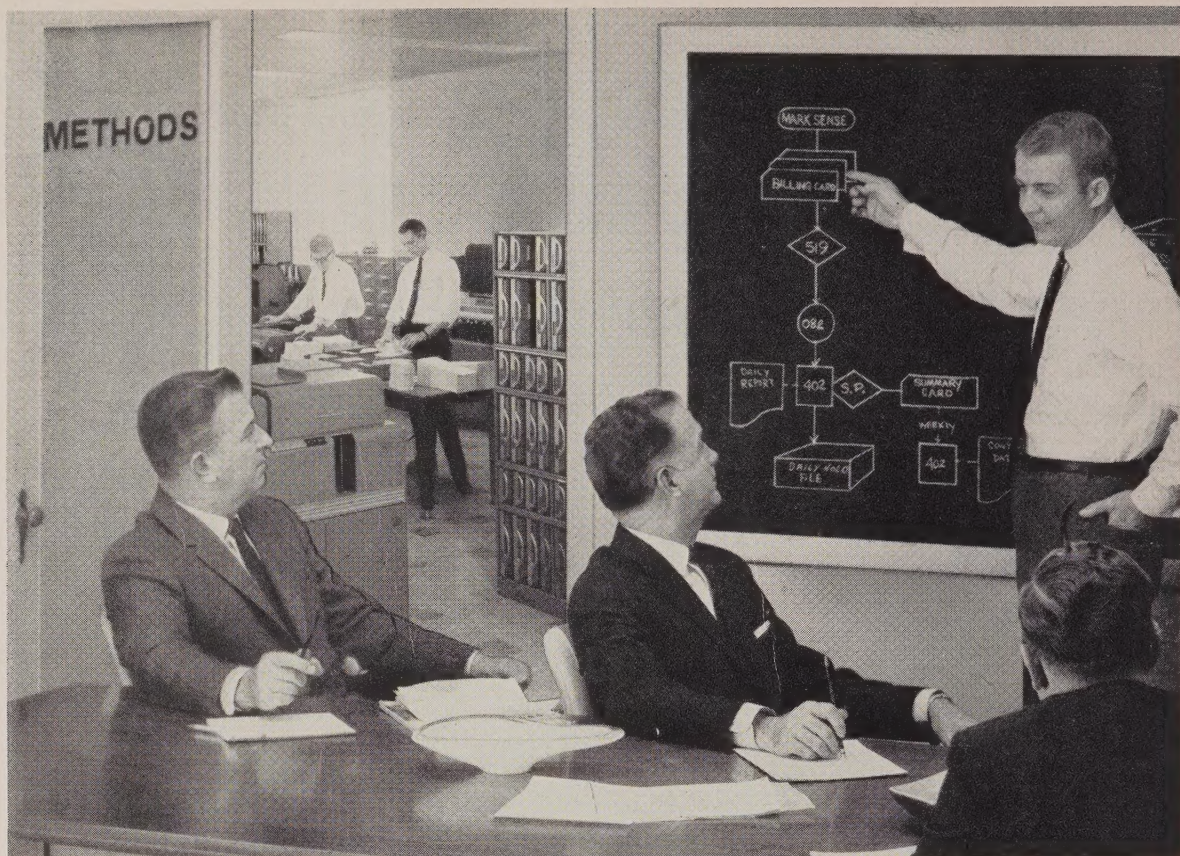


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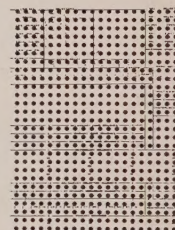
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# Management and BUSINESS AUTOMATION

January, 1961

Vol. 5, No. 1

*New ideas, developments, applications, results, and the human impact of business automation in commerce, industry and government.*

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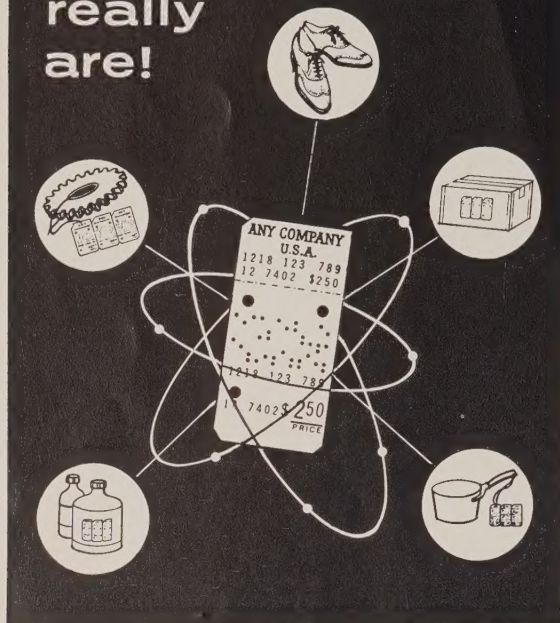
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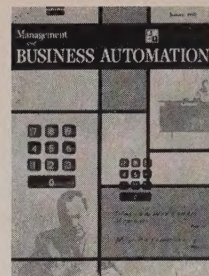
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## Scanning the issue



**SIX INDUSTRY EXPERTS** selected by the editor to participate in the second annual round-table discussion had so much of importance to contribute to the readers that it was necessary to make a temporary departure from regular policy and present the detailed discussion in two-part form. **Effects of Business Automation in the Sixties**, page 18. The series will be concluded next month and it is felt that the reader will agree that the wealth of information was well worth the slight inconvenience of a "continued" feature.

Demonstrable superiority is a way of business life at S. C. Johnson & Son, Inc. "A new Johnson's Wax product must have such superiority in at least one respect or we will not put it on the market," says William C. Kidd, treasurer. This philosophy extends well beyond the product line. You can sense it in every department; you can see it in Johnson's celebrated Frank Lloyd Wright building, one of the "Seven Wonders of American Architecture"; and you can find it in the new electronic and integrated data processing system.

The story, **Johnson's Wax Sharpens Management Reflexes**, page 24, describes both a new system and a new management concept. The system is an NCR 304 computer, the first commercial computer installation of the National Cash Register Co. Johnson's decision to purchase a 304 was made in January, 1958, while the 304 was still on NCR's drawing board, and after a number of other systems, some that were then available, had been evaluated. The faith of Johnson's management in the system, and the concept, has payed off.

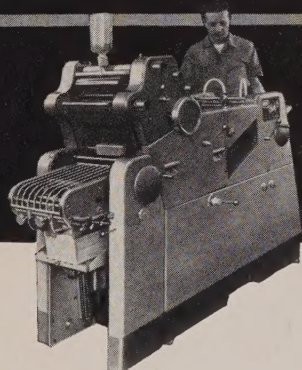
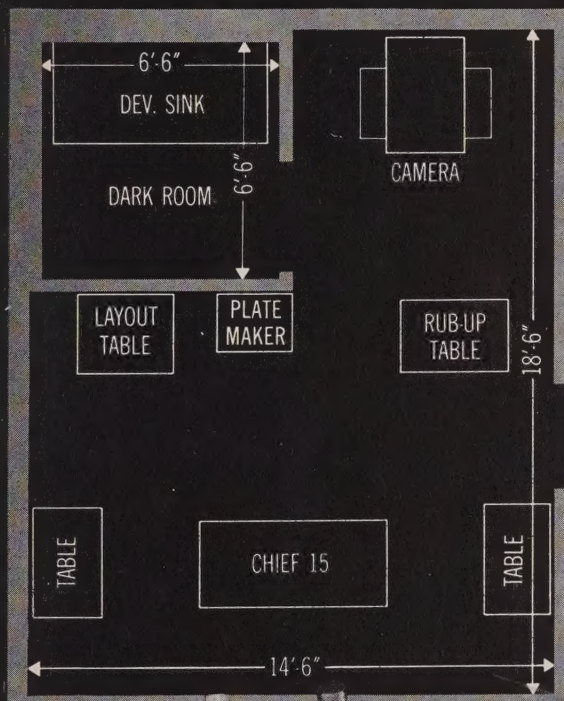
**Central Control of Branch Inventory**, page 30, is only one phase of a new concept in "reliable field support" of products as envisioned by the Electronic Controls Division of General Controls Co. All areas pertaining to after-sale service are centralized in a new Logistics Department which functions as a unit to handle general service, overhaul and repair, provide spare parts and offer supporting technical data.

The company considers the availability of spare parts in every branch as a prime function of the Logistics Department. Every effort is made to insure uninterrupted service life for products with an absolute minimum of inventory investment on the part of the customer. This is the kind of extra service that makes sense in a competitive field.

The Stock Transfer Department of the Chase Manhattan Bank in New York is a very active place, as can be seen in **Automation Pays a Million Dividends**, page 32. By combining two systems through the use of a third "integrating" unit, the bank offers a high-speed service in stock dividend disbursement.



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Heart of this plan is the ATF Chief 15, the small press with the big press features...the press which has been chosen by over 1500 professional printers. You can see this press and the related "package" equipment in operation at your nearest ATF Branch Office; or your ATF Representative will supply full details, including a folder, "How to Set Up for Offset," which outlines various plans and choices of equipment. If you prefer, use the coupon below.



ATF Type Faces used in this advertisement: heads, Craw Clarendon; text, Bodoni Book; coupon, News Gothic Condensed.

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(If you have trade-in equipment, list descriptions, models, serial numbers)





**1 MODEL 28 AUTOMATIC SEND-RECEIVE SET**—facilities for sending and receiving messages plus tape preparation and reading, receiving in tape, integrating tape and manual keyboarding. Incorporates major components of Model 28 line in single, compact console—a "complete station."

**2 MODEL 28 SEND-RECEIVE PAGE PRINTER**—for sending messages by direct keyboard, receiving incoming traffic, providing print-out facilities. Sprocket feed, horizontal tabulator and form positioning arrangements available. Both this unit and the automatic send-receive set are equipped with the "Stunt Box," a built-in control and switching device.

**3 MODEL 28 TAPE READER**—advanced reader-distributor design permits (1) reading of punched tape for serial transmission; (2) reading of punched tape for simultaneous output on parallel-wire basis; (3) translating of electrical impulses from an external parallel-wire source for serial transmission. Available for 5 or 6-level code.

**4 MODEL 28 TAPE PUNCH**—receives incoming electrical signals, punches a 5-level tape and prints-out data on the tape. Used for message relaying, combining data from several sources on a single tape, or providing punched tape as a by-product of send-receive operations for input to business machines.





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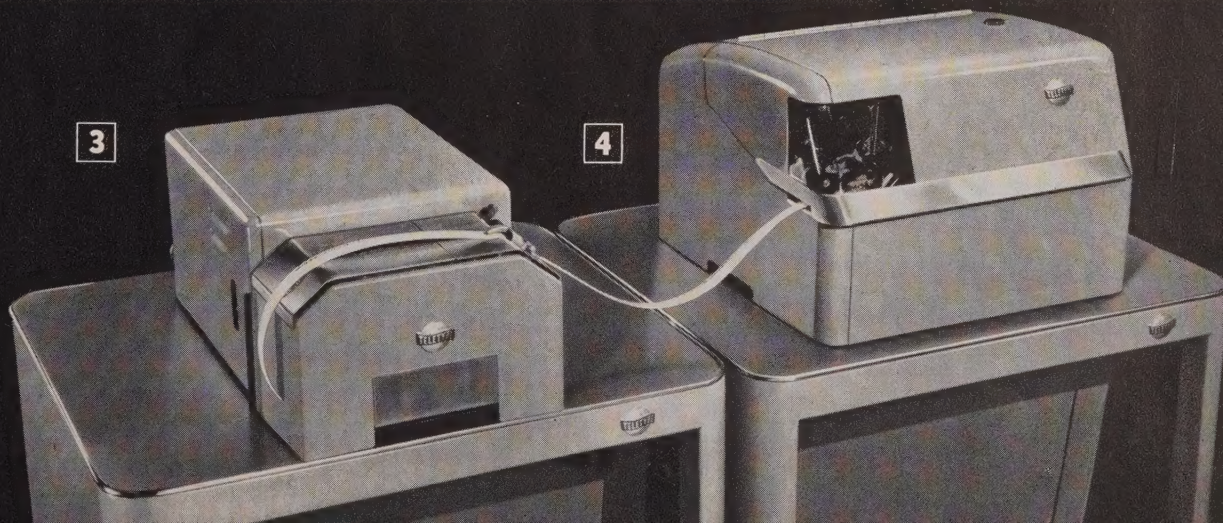
The Teletype Model 28 line is specifically designed for continuous operation and very low maintenance. All-steel clutches and simple harmonic-design elements insure reliability and greatly reduce servicing needs. For example, the lubrication interval when operating at 10 characters per second is 6 months or 1,500 hours' operation, whichever occurs first.

Teletype Corporation manufactures this equipment for the Bell System and others who require the utmost reliability from their data communications facilities. Can be used with Data-Phone and other communications services.

**More Information.** Write for descriptive literature folder on Teletype Model 28 line to Dept. 17A, 5555 Touhy Avenue, Skokie, Illinois.

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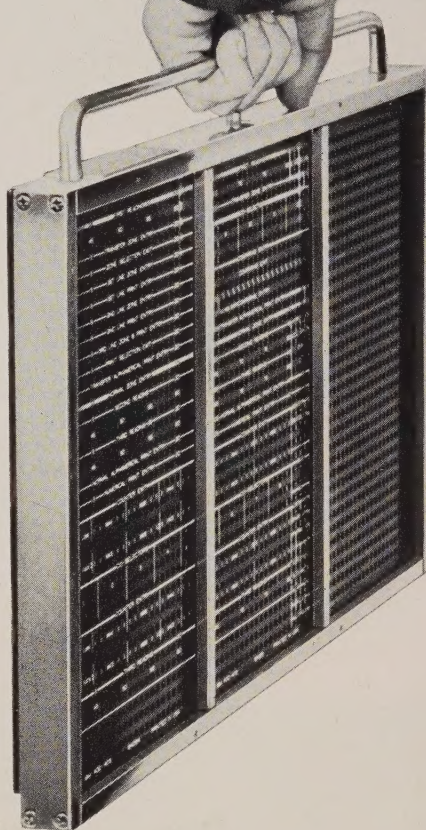
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# RANDOM ACCESS

*Information bits from  
the Editor's memory file*

## True Confessions of Computer Experts

It wasn't wishful thinking on the part of Remington Rand's Univac and IBM's 7090 that brought the early election night projection of a Nixon victory. It was inadequate programming.

This error in programming was a candid admission made by Dr. Eugene E. Lindstrom of IBM, who directed the election computing activities for the IBM/CBS team, and Stephan Wright, Applied Data Research, Princeton, who served as Univac/ABC team consultant. The men joined Dr. Jack Moshman, of C-E-I-R, Inc., director of the RCA/NCR operation, at a recent meeting of the Washington, D. C., Chapter of the Association for Computing Machinery, devoted to a post-mortem of the computers role in election forecasting.

Both Lindstrom and Wright agreed that their relatively simple approach was the main reason for the faulty projections. IBM's approach used past election returns, state by state, as a base, expanding them nationally. The heavy Nixon vote from Kansas, Tennessee and Kentucky, which led to the computer's early claim of a Nixon win, was later outweighed by returns indicating a strong Kennedy swing.

The Univac method was virtually identical to IBM's, and was basically an updated version of the successful mathematical models used in 1952 and 1956 elections. It was assumed that the trend in early reporting states would hold true later. It turned out, however, that the local influences in early reporting states were stronger than the national influences, meaning that the Nixon victory forecast was actually based on a non-representative sampling of election returns. An obvious Univac handicap was the memory of the 1952 election when the early Eisenhower prediction was suppressed.

Relating the details of the RCA 501's successful projections of a Kennedy victory, Dr. Moshman explained that their team started with a "base line projection" incorporating all available information—including polls. This "time zero projection," completed on Sunday, Nov. 6, gave a projected popular vote of 50.4 for Kennedy and 49.6 for Nixon, and an electoral vote projection of 291 for Kennedy.

Returns for key precincts were compared to measure deviations from the base line projection. Hour-by-hour time curves, an indication of how each state voted in the past, were stored in the RCA 501's memory, and as returns came in, they were adjusted to take this curve into account.

Unfortunately the faulty prognostications in addition to raising Republican hopes and Democratic blood pressure, left a huge T.V. audience with the impression that the computer performance was a laughable flop. Actually, the machines performed faultlessly—according to instructions.

**18<sup>TH</sup>**  
ANNUAL  
OMAC

1961  
MIDWEST  
SEMINAR  
AND  
BUSINESS  
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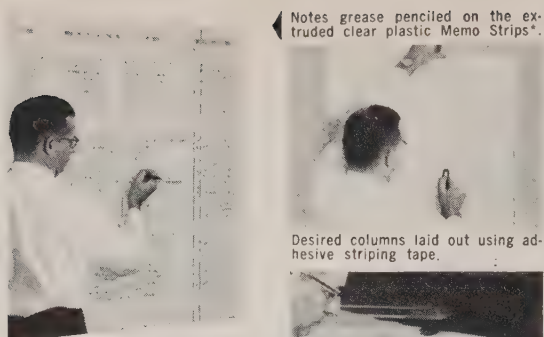
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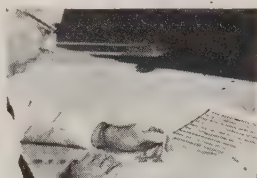
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### BUSINESS AUTOMATION

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## from the Publisher's Desk

**TURNOVER.** This is the word that keeps our circulation department constantly on the go. Since we got underway two years ago, we have averaged almost 400 changes in reader status each month. This means that 20 percent of our readers change jobs or location in a year.

The turnover does not have the same causes as is the case in most businesses. Very few of the firms which meet our qualifications are going out of business, neither are they moving out of automated data processing once they have made the plunge.

Our problem centers around the fact that the publication is not sent to companies but to individual executives. These men certainly do move around. Some go to other firms and consequently do not meet our qualifications in their new positions. Others are transferred to different positions within their own company and must relinquish their responsibility in the area of data processing. Some just disappear, and, as always, the "Grim Reaper" takes its toll.

There is one other source of turnover which, we are happy to report, constitutes only a very small percentage of the total. These are the people who frankly tell us they are too busy to read the magazine, or they feel that the editorial material we offer is of little interest to them. We know we can't please everyone, and we hope that we can keep the number in this group as small as it has been so far.

Because those involved in business automation and data processing do move from job to job—a condition which will continue while the industry grows so rapidly—I want to address a special appeal to all readers, for your benefit as well as to help our circulation department. Please notify us promptly when a job change is made, and, if possible, send the address label from the most recent issue of our circulation department. You can be sure that we will do everything possible to continue your magazine without interruption.

*Charles W. Gilbert*

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For More Information Circle Reader Service Card No. 159



# OEMI 'Spectacular' Impresses Western Executives

MORE than 31,000 executives from 13 western states attended The Business Equipment Exposition during its presentation at the Los Angeles Sports Arena, Nov. 1 through 4. Sixty-four manufacturers of business automation equipment and supplies displayed more than \$30,000,000 worth of the latest products and systems at what was easily the most complete and spectacular exposition in business show history.

Sponsored by the Office Equipment Manufacturers Institute, 44-year old trade association of the four and one quarter billion dollar a year office equipment industry, the Los Angeles show was the second in a continuing series of expositions which are planned to reach every major market area in the nation.

The show opened at 12 noon on Nov. 1 with a signal bounced for the Navy's navigational satellite, Transit II. Principal speakers at the opening ceremonies were Fortune Peter Ryan, immediate past president of OEMI and president of Royal McBee Corp., and Admiral Jack P. Monroe, Commander of the Pacific Missile Range.

Mr. Ryan stated that "while the Russians are stepping up their electronic computer production, they will still be a distinct second to the United States five years from now." Admiral Monroe commented that without computers and other business equipment America's defense program and economy would come to a halt.

In conjunction with the exposition MANAGEMENT AND BUSINESS AUTOMATION magazine conducted its annual round-table. This year's subject, "The Effects of Business Automation on Industry During the 1960's," was discussed by top industry experts. (See Page 18.)

Mr. E. D. Taylor, administrative vice president of OEMI, announced that the third exposition will be held in the New York Coliseum, April 17 through 21.







\$30 million worth of products and systems—on display at the Los Angeles Sports Arena.



# Letters

Dear Sir:

I want to thank you for the impressive article in your publication about the "Termatex" approach to information retrieval. We have had enthusiastic comments on it and the article is helping us considerably. I am grateful.

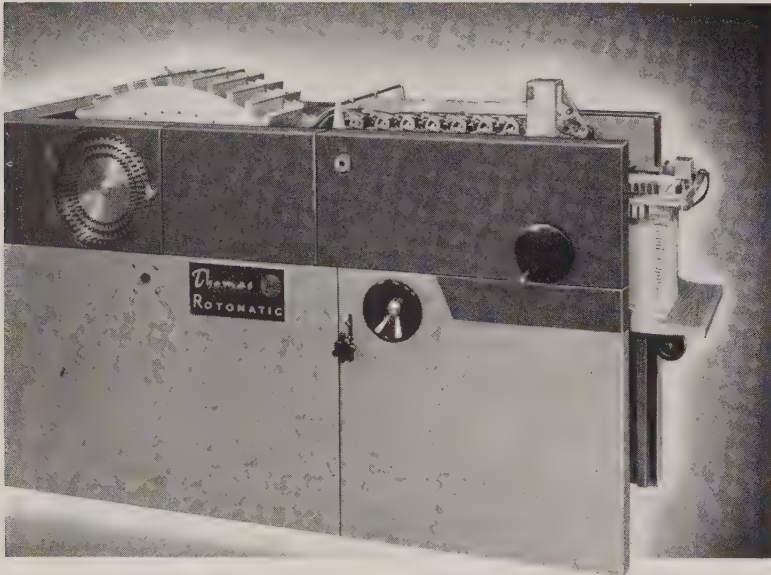
Frederick Jonker  
President  
Jonker Business Machines, Inc.

Dear Sir:

Your magazine has been very kind to the Systems and Procedures Association. I am referring to your very generous article on page 14 of your September, 1960, issue. In this article, you gave SPA very fine publicity in anticipation of the International Systems Meeting, held in New York, October 10-13, 1960. You were especially kind in the

editorial (October issue) in which you presented "Salute to SPA." Board of Directors have directed me to express our appreciation for this very fine piece of writing. Our association hopes to merit your continued support and we will do everything possible to live up to the obligation we have to the business community.

Keith DeLashmutt  
President  
Systems and Procedures Assoc.



## *New 50-Station Collator pays for itself in a year!*

No empty claim! 94 recent installations prove it over and over again! Manhours saved, overtime eliminated pay the way for Thomas' new Rotomatic. This, together with other performance-proved facts, turns the assembling of duplicated sheets into sets from a time-eater to a profitable worksaver. In versatility, speed, accuracy and compactness, none can compare. You're your own best judge — write for more information.

- Accurately collates, counts and staggers 25,000 sheets per hour . . . stitches at a slightly lower rate. Occupies only 17½ square feet of floor space.
- Exclusive pushbutton programmer permits different collating jobs to be run at the same time.
- Loads in less than 7 minutes . . . no vacuum systems or fans to adjust, no need to compensate for weights or finishes of stock.
- Handles sheet sizes from 7¼" x 8" to 11" x 14" in almost every weight and finish. Foolproof miss and double detector stops machine instantly, preventing errors in finished sets.



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*A subsidiary of Thomas Collators Inc.*

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For More Information Circle Reader Service Card No. 160

Dear Sir:

Your thought-provoking article entitled "Rockets, Budgets and EDP" was read with great interest by several members of our Management Staff. They have suggested that we obtain your permission to reproduce this excellent article in our internal publication the Automatic Data Processing Newsletter.

J. M. Wauters  
Management Operations  
Rocket Operations Center  
Thiskol Chemical Corp.

*Ed Note: Permission granted.*

Dear Sir:

Having received the September 1960 issue of MBA, I would like to express my appreciation for the high quality research and presentation contained therein.

Several individuals have asked me to obtain another copy of this edition for their perusal.

Morton D. Kirsh  
Manager, Research Department  
Hannaford & Talbot Corp.

Dear Sir:

We were pleased to hear of your mention of our organization, the National Society of Data Processing Machine Operators and Programmers, Inc. (October, 1960).

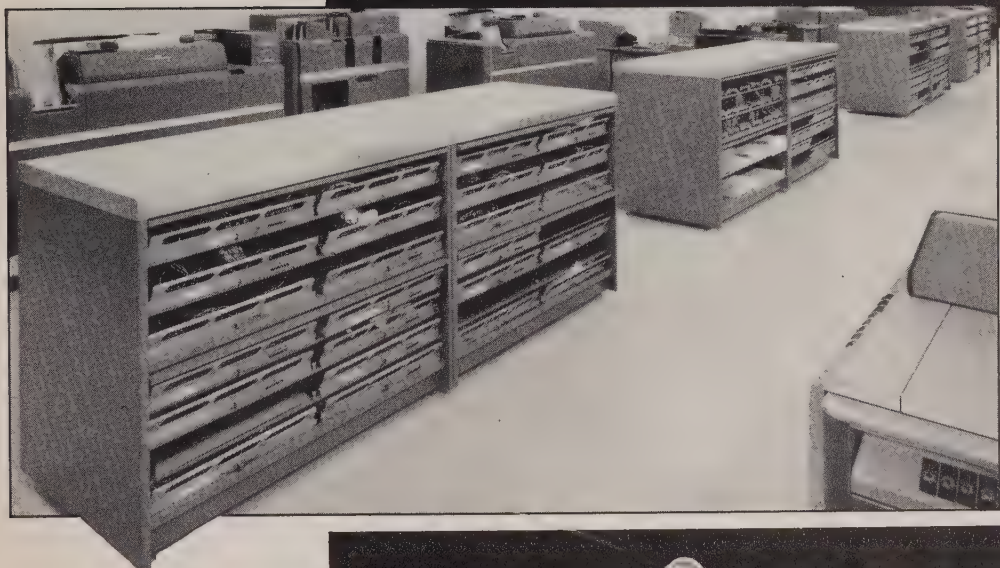
You may be happy to hear that we have received letters requesting information about the society from all parts of the country as a result of your mentioning us.

Stephen P. Sims  
The National Society of  
Data Processing Machine  
Operators & Programmers, Inc.



# THE BEST LOOKING DEPARTMENT...

... can now be the data processing room! Real front office beauty goes hand in hand with efficiency and unexcelled flexibility, when TAB STORAWAYS are installed. Typically attractive new data processing department (below) relies on Storaways as work centers with flexible capacity for ALL control panels as well as other needed materials.



Note how shelf dividers keep panels in place. See how door retracts out of way above compartment.

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MBA panel members from left to right are: G. Smith, Univac; N. J. Dean, Booz, Allen and Hamilton; A. F. Wike, Addressograph-Multigraph; A. E. Keller, MBA; P. Hyde, A. B. Dick Co.; W. W. Simmons, IBM; G. M. Ryan, Friden.

*MBA Round Table Discusses . . .*

## Effects of Business Automation In the Sixties

In the first of a two part series, MBA's panel of experts predict a "moneyless" economy, discuss computer's role in business forecasting and challenge job displacement myths.





A "MONEYLESS" economy that would eliminate the exchange of cash, checks, money orders, invoices, receipts and other paper in favor of a universal and automated credit card system, and the ability to anticipate changes in business patterns long before they happen by testing "business tomorrows" are two of the many possibilities that business automation will bring to American industry during the years ahead.

These and other important predictions were made by six experts of the office equipment and management consulting fields who participated in a round table discussion on "The Effects of Business Automation on American Industry in the 60's," sponsored by MANAGEMENT and BUSINESS AUTOMATION magazine. The round-table, second in a series, (see MBA, Dec. '59) was held at the Los Angeles Sports Arena in conjunction with the recent Business Equipment Exposition presented by the Office Equipment Manufacturers Institute.

Participating on the MBA panel were: Gordon Smith, Director of Marketing, Univac Division, Sperry Rand Corp.; Neal J. Dean, Partner in Charge, Management Information Systems, Booz, Allen and Hamilton; Albert F. Wike, Sales

Research Director, Addressograph-Multigraph Corp.; Phil Hyde, Application Development Manager, A. B. Dick Co.; William W. Simmons, Manager of Market Planning, IBM Corp.; and George M. Ryan, Manager, Systems Division, Friden, Inc. Arnold Keller, editor of MBA, was moderator.

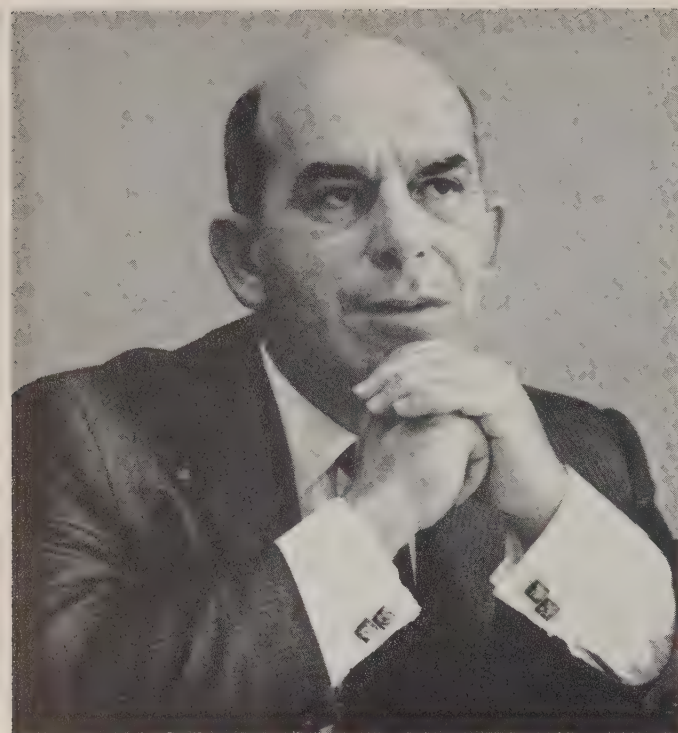
In opening the discussion Mr. Keller acknowledged that a broad subject had been purposely chosen as a topic for the panel in order to provide participants with an opportunity to air their views on the many implications—social and otherwise—that the advancing techniques of business automation might hold for the American economy.

Each of the panel members contributed an opening commentary on the subject before the general round-table discussion got under way. A summary of the opening remarks follows:

MR. SMITH: We at Univac are concerned that, after ten years of computers, there are users who continue to struggle under the unnecessary burden of unprofitable and unsuccessful installations.

Customers in growing numbers are selecting computers in a new and, to us, very alarming way. Attention is laid upon equipment to such an extent that it amounts to virtual exclusion of overall sys-

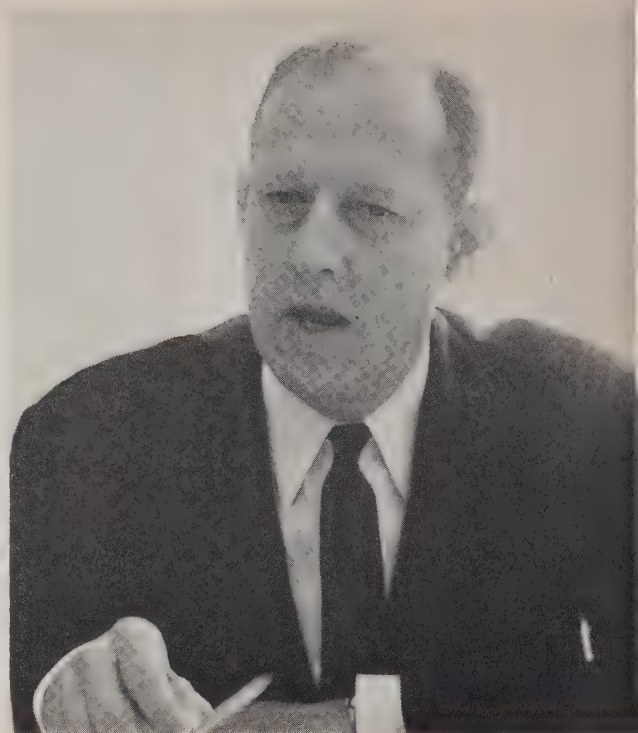




MR. WIKES: "Maximum gains from office automation during the next decade will be assured if manufacturers, methods and procedures people and management engineers apply their best mental efforts to practical application of powerful machinery available to them."

tems design and better problem solution. Potential computer users are destroying a package of services painstakingly assembled by the computer manufacturer from years of proved experience. Users are throwing away the benefits that arise from the power and value of competition to study and solve problems. Like the lawyer who tried his own case, some computer users have come to learn the hard way that they have a fool for a client. For potential users are boxing themselves in to a point where the sole decision rests in the choice of competitive machinery. This represents a broad departure from the bookkeeping and punched card days, when the same customer expected manufacturers to present an overall systems design concept responsive to clearly defined goals and specific problem solutions.

The difficulty seems to begin something like this: An electronic data processing committee designates an isolated, bench-mark problem or application as a yardstick for proposals by computer manufacturers. To this problem, completely divorced from a total systems concept, this same committee affixes a time limit, and requests the problem be programmed and topped off by an actual demonstration of a hypothetical situation.



MR. SIMMONS: "We can only enjoy the benefits of the second phase of business automation if we face the problems . . . take the responsibility for education, orderly transition, informed and secure working staffs . . . say we care more about people than machines."

The result: musical chairs for the computer manufacturer. He has nowhere to go and nothing to sell but naked hardware superiority against competition. This is a decidedly unhealthy climate that precludes consideration of the many professional services the computer manufacturer is ready and quite willing to offer the user. It consumes many man years of talent, with little of lasting value achieved.

### Today's paper mills

Consider the thousands of dollars wasted on proposals dealing with hardware and machinery considerations and the obvious higher cost of sales that they occasion, which naturally is passed on eventually to the user. How much more profitable it would be if the user would either make an early decision on a supplier and then direct combined attention to overall systems design at the outset or ask for independent suggestions for problem solution from each manufacturer weighing his overall competence in the field of machinery, hardware, programming and systems and industry experience. We at Univac are quite clear on this, for in the first ten years of computers we have





MR. SMITH: "In the first ten years of computers we have learned two things: how to make a successful computer installation and, how not to. The days of hit or miss are over, and there is no need to pioneer any further."



MR. RYAN: "We think that business in the '60's will have data originating areas equipped with peripheral equipment, and creating original documents and by-product machine language. . . . Computers will be in wide use by even the most modest of organizations."

learned two things: first, we have learned how to make a successful computer installation; and, to be perfectly honest, second, how not to. In short, the days of hit or miss are over, and there is no need to pioneer any further.

MR. DEAN: Future predictions of what automation will bring to the industrial and commercial world are hazardous, at best. However, past and current developments in electronic data processing suggests that major changes can take place in business transactions within the next two decades. A key to our automatic business future is seen in today's rapid transition to fully automated banking transactions. Tomorrow's banks, in effect, may become financial utilities which handle vast volumes of both private and commercial business transactions on electronic data processing equipment, instead of the paper mills which they really have become today. Inputs to such utilities could range from magnetic tapes to coded dial phoning, utilizing automatically readable credit cards. Such a change could largely replace the use of money and checks, leading us to an almost moneyless economy.

This evolution would require low-cost, simple recording devices and continued progress in devel-

opment of equipment, particularly in the communications field, and large capacity, small, inexpensive microsecond memories. Among the possible changes in business transactions in the future, in addition to banks emerging as financial utilities, are: department store shopping without sales slips; supermarkets that have no checkout stations; dial phone payments to doctors, dentists and other professional obligations; ticketless traveling, and obviously no ticket lines; and the last, but not least—in fact, this is probably the negative that will kill the whole idea—the frightening prospect of electronically computed income tax returns.

### . . . and that other vice

The Internal Revenue service could dispense with most of its investigating agents, and income tax revenue would rise, because virtually every financial transaction would be recorded as it occurred. No individual income tax returns would be necessary. Instead, the individual's fund account would be automatically charged at the financial utility, as a result of a governmental calculation, on an exact, accurate basis. All of this is a practical possibility in the next decade with only modest





MR. DEAN: "Today cash is obsolete . . . and tomorrow checks will be obsolete, much as this appalls bankers who are finally finding out how to handle millions of checks. Credit cards could lead us to an almost moneyless economy."

improvements to existing equipment; however, the sociological changes that some of these changes require will probably take over 20 years. Today we can merely say that cash is obsolete, except for three things, and that is gambling, bribes and that other vice—although I have seen credit cards for it. And tomorrow I think checks will be obsolete, as much as this appalls commercial bankers of the country who are finally finding out how to handle these millions and millions of checks.

MR. WIKE: I think it might be desirable to define briefly the areas that we think automation includes. First of all, through the utilization of existing business machines, many paperwork jobs have been converted from manual to mechanized operation. Machines on the job, where the job is done, have contributed greatly to the automation of many required paperwork tasks. It has been proven that electronic data processing techniques can provide tremendous advantages to many businesses by expediting required record keeping and providing management with up to date information necessary to properly direct the activities of a business.

Major advances were also made in the integration of various types of business machines through



MR. HYDE. "The most important areas of improvement must be in the information input and output to keep pace with the speeds already available in data handling equipment. Because businesses are run by people, not by machines."

the common language of punched paper tape. This technique has brought many desirable features of paperwork automation within the economic reach of small businesses. Another area in which progress has been significant is that phase of automation which has to do with reducing the amount of manual effort required to operate a business machine. Duplicating and accounting machines, in particular, has been provided with features which automatically control the sequential operations of the machines to the point where manual effort has been reduced to the minimum. This type of automation has also reduced the problems and costs connected with machine operator training.

### Knotty problems

We expect that the 1960's will see further progress made in all of the areas mentioned at an ever increasing pace. Insofar as electronic data processing is concerned, it has been difficult to evaluate accurately the economic gains to the users of the equipment. To a lesser degree this applies to integrated data processing systems utilizing punched paper tape. While unquestioned benefits have accrued in the form of labor savings and in the



reduction of errors, these advances have been, in part, offset by relatively high equipment and installation costs. This is an area in which the business equipment industry can contribute heavily to the overall benefits of automation through the development of more efficient and less expensive machinery.

Probably the greatest opportunity for further improvements in business automation techniques during the next decade exists in what are termed the peripheral areas of automation. Data processing speeds of the equipment available today are adequate for all but the very largest job requirements. The problem solving ability of existing machine logic is sufficient to meet most business needs. The knotty problems seen to exist in the original recording and collecting of the data to be processed and in the ultimate output of printed records and reports. It is unfortunately true that data processors, as we know them today, understand and speak a different language from that understood and spoken by human beings. In many instances, a single paper document must control human activity and at the same time serve as the means for introducing data for processing.

### **Their best mental effort**

EDP systems impose rigid requirements on the quality and organization of input data. In many instances, source data upon which the efficient operation of an entire EDP system is based must originate in a large number of decentralized points, each one of which reports a relatively small number of transactions per day. A typical example is found in the general field of production control. Information which, in the beginning, was used to instruct the worker in the requirements of his assigned job must also be used to instruct the EDP system. This basic requirement indicates the need for simple, low cost equipment which can be installed in a large number of locations at the source of the original input information.

If the opportunities for progress through automation are to be fully realized in the forthcoming years, increasing attention must be given to the indoctrination and training of the people in industry who are responsible for directing and utilizing the powerful machinery at their disposal. Better systems concepts must be developed. Integration of procedures on a company wide basis must be achieved so that the data developed in each department is compatible systemwise. Programmers and methods people within industry must be made aware of the real needs of the business. The potential of automated data processing cannot be realized if applications of the techniques are confined to the mechanizing and speed-up of existing routine procedures.

On the other hand, if truly useful management data is to be provided, so that effective operating plans can be made, the people who direct and operate the data processing machinery must really comprehend the problems and objectives of their company. Maximum gains from office automation during the next decade will be assured if equipment manufacturers, methods and procedures people in industry, and professional management engineers, jointly and cooperatively apply their best mental efforts to the practical application of the powerful machinery which will be available to them.

MR. RYAN: We think that preoccupation with electronics and computers has obscured an essential fact, that most data processing is now done, and will probably continue to be done, at the point of origin. All document preparation with automatic writing machines, or with key driven machines that also produce a machine sensible record, must certainly be included in any broad definition of the term. But let's look at the future, when computers will be in wide use by even the most modest of organizations. It is significant that internal speeds of computing machines have far outstripped the speeds with which data can be gathered and fed into them. This, plus the rigid requirement for accuracy of data before it enters a computer, leads us to the conclusion that the preliminary processing of data will become increasingly important to business executives.

As a system is no more reliable than its input, any peripheral equipment capable of reading tape or cards and providing by-product machine language materially improves the integrity of that system. We think that business will have data originating areas equipped with peripheral equip-

*Continued on Page 38*

next month . . .

**More on**

## **Operations Research**

**"A crystal ball at management's disposal."**

*And . . . An Exciting New Concept—*

## **Continuous Flow**

## **Modular Accounting**

•

**"Effects of Business Automation in the Sixties" . . . Part Two**





## Johnson's Wax



Two tangible symbols of Johnson's Wax progress are its Administration and Research Center, Racine, Wisc., designed by Frank Lloyd Wright (top picture), and the first commercial installation of NCR's 304 computer system.



# Sharpens Its Management Reflexes

**A**N UNUSUALLY effective television commercial, or two consecutive rainy weekends can bring about a drastic change in sales trends at Johnson's Wax. If a national sales increase is not spotted in time, warehouse stocks become depleted and Johnson's loses valuable shelf space in local retail stores, causing a drop in both current and future sales. To dominate in such a volatile industry requires sharp reflexes. Thanks to a new concept in integrated electronic data processing systems, Johnson's business reflexes are razor sharp.

The company's computer system, a "304" manufactured by the National Cash Register Co., is linked by leased wires to 23 warehouses and sales offices, enabling management to take action today on inventory requirements based on yesterday's actual inventory and unfilled order position.

Within defined limits, the computer can adjust Johnson's finished goods distribution, and its production and purchasing plans, on a day-to-day and week-to-week basis.

The increasing dynamicism of its industry was a major factor in Johnson's decision, in 1956, to investigate the possibilities of an electronic computer. The company had been a punched card user for some 35 years, and while the machine accounting system was itself a model of perfection, management felt that future demands upon the system would undoubtedly necessitate an electronic approach.

Robert D. Whisler, systems and audit manager, received the assignment to conduct the preliminary survey. Whisler's survey concluded that Johnson's could justify the purchase or lease of a computer only if the system integrated all possible operations. He also concluded that such a system would have to link all of the company's facilities to enable management to react quickly to changing

conditions. The original investigation was brief, but was so thorough that the system today still conforms to these general recommendations.

The formal feasibility study, also conducted by Whisler, took nine months and consisted of five separate steps: (1) the development of an order processing flow chart; (2) the development of statistics on input, file storage and report requirements for the system; (3) written proposals solicited from four computer manufacturers; (4) the proposals were evaluated with the assistance of the management consulting division of Johnson's auditor's Lybrand, Ross Bros. & Montgomery, and (5) a final

review of cost versus benefits was made, and the committee recommended that a National 304 be purchased.

Johnson's Wax selected the NCR 304 because it had the speed, versatility and reliability to fit in with the over-all EDP plan. The computer system processes punched paper tape after the data is received from the branches over the leased wire. Punched tapes are accumulated during the day, read directly into the computer that night. No intermediate steps or conversion to other media or codes are necessary, because of the computer's 1,800 characters-per-second speed of direct tape reading.

The punched tape becomes a common denominator of all media, and is applicable to all parts of the system. Just as important, employees in the field create the punched tape for input on an hour-by-hour, day-by-day basis. The clerical load is thus distributed over the entire organization, yet the data processing is centralized at a single point.

An analysis of job costs revealed that the 304 had the lowest cost per job of the various computers considered. By completely replacing the tabulating system and eliminating statistical and

**New computer and direct wire system links facilities and provides quick management reaction to changing conditions.**





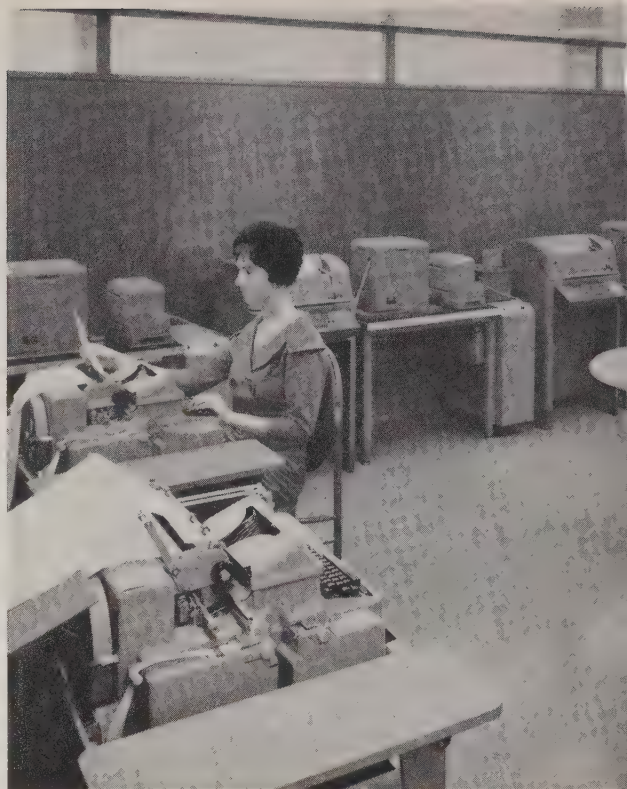
R. D. Whisler, systems and audit manager, is shown in a planning session with Johnson's treasurer, W. C. Kidd.

record-keeping jobs in the branch offices and warehouses, the EDP system generated enough tangible savings alone to justify the purchase. Johnson's estimates that savings and additional profit in the intangible area will be greater than the estimated tangible savings. Even in the area of company communications, the private wire provides sufficient time to handle administrative messages to and from the field organization, in addition to data transmission.

### Scrapping losses

Another intangible: The ability of the computer wire system to ship an invoice within 24 hours after receipt of the customer's order will result in an increase in company sales. Many retailers, especially chains, are endeavoring to operate with a minimum warehouse inventory. Failure to deliver merchandise results in a loss of Johnson's products on the retail shelves, and in effect, lost sales; it also provides an opening for competitors products which may be even more damaging.

The computer system provides the customer with his invoice some four days earlier than the old system, another plus since many customers



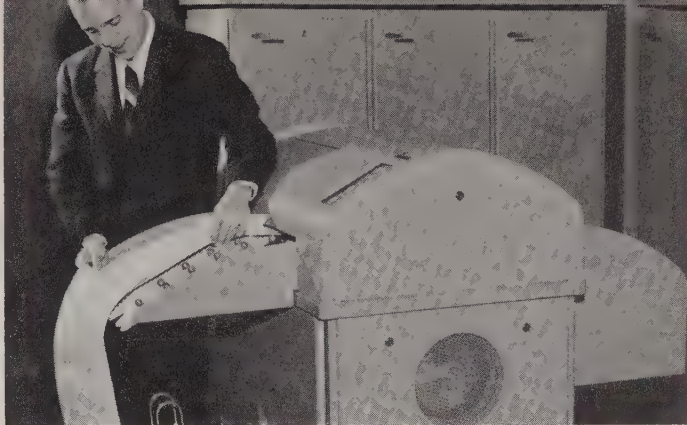
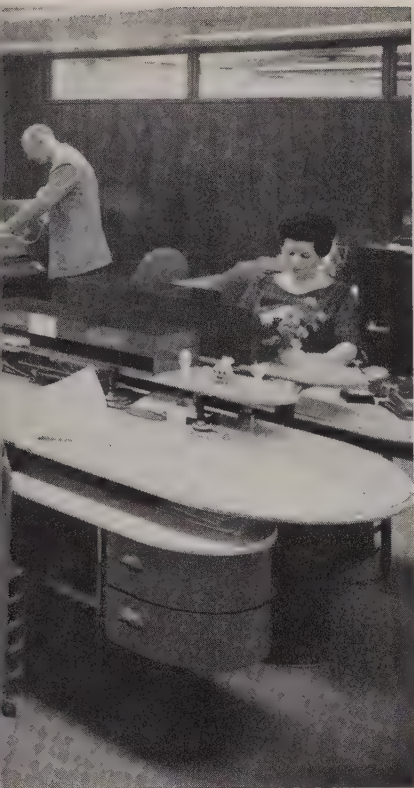
John Harrits, data input supervisor, directs activities in wire room and checks paper tape which is computer input.

will not put merchandise on the shelves until they have received the invoice. Even orders requiring the credit manager's approval can be processed promptly, eliminating the three or four days required formerly.

The ability to improve inventory control by use of the computer system results in increased inventory turnover. In 1956 and 1957, the finished goods turnover was a little less than six times a year, or about once every nine weeks. An increase of the inventory turnover to seven times a year, or about once every seven and a half weeks, results in an inventory reduction of an amount about equivalent to the cost of the computer. This increase in inventory turnover reduces inventory investment and also greatly improves "product flexibility." The smaller the finished goods, container, and raw material inventory for a product, the quicker the company can change the packaging or formula of the product without incurring substantial losses through scrap. The quicker the change, the quicker the possibility of increased sales.

How complete and how integrated is the S. C. Johnson system? After only a few months of operation, it is already integrated enough to care for the immediate and conventional task of handling

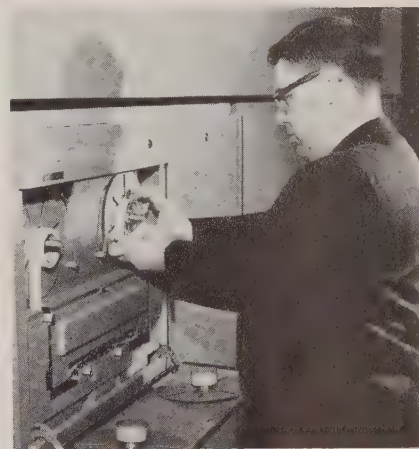




John Ambruster, chief programmer, holds operation of a printer back to check the daily warehouse shipping schedule.



Roger Thornberg, computer operations supervisor, is shown sitting at console.



Robert Sullivan, programmer, loads the paper tape reader.

clerical and bookkeeping functions. It is also used for planning and control of the Johnson organization—more efficient allocation of inventory, more effective control of a far-flung field organization and better customer service.

### The 5 p.m. accumulation

The term "integrated system" at Johnson's combines the basic concepts of business data handling, of communication, programming and reporting. In this way, "integrated" covers both the EDP system and the system of management planning and control. Integration at Johnson's means that each part of the complete system was developed with full regard for the capabilities and requirements of the other. Specifically, Johnson's has linked the original transaction which occurs in the field with the events that occur when the transaction is processed. The data flows automatically through the computer system until it reaches a decision point or judgment area where human analysis is necessary.

Three distinct activities are visible at Johnson's: (1) information flow from the branches through the leased wire communications; (2) information processing and reporting through the NCR 304 computer, and (3) information analysis and decision making by Johnson's management.

The design of the inventory management portion of the system is an excellent example of the word "integration." Whisler realized that Johnson's would have all necessary transaction records available for design of some sort of inventory control setup. Inventory data would be accumulated during the order-processing run when sales, shipments, returns, and so on, would be going through the computer for order processing purposes. This is an ideal situation in which the time-sharing features of the computer can be used.

To discuss inventory management, it is necessary to make a rapid review of order processing, the basic application in the EDP system. In processing an individual order that comes in over the wire, the computer receives all information required for credit control, accounts receivable,



inventory control and sales analysis. These jobs, traditionally separate, have all been made part of the order-processing stream.

After 5 P.M., all orders accumulated on punched tape during the day are fed into the computer, and each order is subjected to a series of reliability checks. When processing is completed, the computer prints out—(1) invoices on all orders shipped; (2) bills of lading, packing lists and shipping stencils, on all orders shipped from Racine; (3) case and weight summaries for bills of lading on branch office shipments which have been approved for credit, and (4) orders which exceeded customer's credit limit, together with complete credit history for the credit manager.

Since most of the fundamental figures for inventory are accumulated during the order-processing run, the next step was to plan for input of production data for inventory control and design the necessary report forms.

## **Shrink the geographical spread**

Whisler formed a committee with members from Production, Marketing and Programming. The "inventory committee" examined present inventory records, production control records and shipping records kept at Racine and in the branch offices. A study was prepared showing what minimum inventory records were needed, and what maximum records were desirable. In the final step, Programming Supervisor John Ambruster worked with inventory analysts to determine what was wanted by the analysts.

To frame the problem another way, the short range goal was to use the desirable features of the existing system of inventory control in conjunction with the wire communication-computer arrangement. Speed of communication, plus the computer's ability to handle a comprehensive inventory program, would improve inventory control at once—would shrink the geographical spread of inventory records to one central set of records.

## **"Shelf facings"**

The long range goal was to utilize the computer in developing more scientific management techniques of inventory control. The ultimate in inventory control, according to William E. Kidd, treasurer, is to maintain maximum "shelf facings" on the retail shelf. "Shelf facings" in the industry is a merchandising concept that means essentially "keep your products in front of the consumer."

The Johnson products must be available at the point of sale if the company is going to capitalize on consumer demand generated by Johnson's advertising and merchandising campaigns. But to develop the most sophisticated system possible,

Kidd and Whisler agree that programming, evaluating and actually testing proposed systems will require separate studies and considerable research time. Meanwhile, immediate use of the 304 to improve present systems will enable Johnson's to produce something a little less than perfect, but a little more than excellent.

## **A specialized dilemma**

Inventory management and control extends from the sales forecast to the final customer shipment. There is a natural conflict between the desire to have high inventories to meet every possible contingency and the desire to carry a minimum inventory to reduce the investment. The desire for economy through larger production runs, larger purchases and larger shipments is offset by Johnson's policy of maintaining a flexible position for product changes. Everything is cheaper by the million unless you don't need it, and in a competitive situation, Johnson's prefers to be able to move quickly as well as economically.

The logical conclusion of this familiar—yet specialized—dilemma is an inventory control plan that compares actual results with objectives or standards. A description of the system necessarily begins with the sales forecast.

Sales forecasts are determined from historical data, current sales, merchandising plans and estimated future sales. The actual forecasting relies greatly on the product manager's understanding and comprehension of the market; the computer rapidly compiles and summarizes statistics from which an analytical decision can be made.

## **The seasonal Raid**

A primary report is the "Weekly National Forecast and Inventory Report." For each product size, the computer summarizes total orders, scheduled shipments and shipping forecasts, which are in turn related to available inventory and scheduled production. This report gives a 13-week projection for each product size, plus a nine-week history, and it is updated each week.

A second key report is the daily "Warehouse Shipping Schedule." This report compares requirements to available stock and recommends quantities to be shipped for branch warehouse replenishment if total required weight equals a carload or truckload or if a product is in a critical condition. This report gives a comprehensive picture of a complex business problem and is indicative of the wide-ranging capabilities of the 304. Other weekly reports cover warehouse shipping trends, product inventory status by warehouse, low-stock items and a Racine inventory projection.

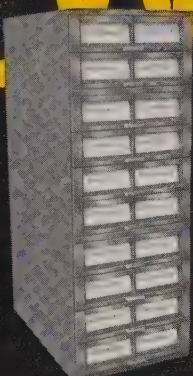
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# NEW GOLD STAR FILES

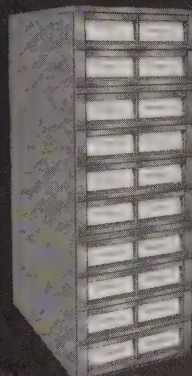
*by Wright*

**20 DRAWER**  
Full Suspension  
CAPACITY  
535 filing inches  
(80,250 cards)



PRICE  
Without lock ..... Cat. #1380-11 ..... \$235.00  
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**20 DRAWER**  
Three-Quarter Suspension  
CAPACITY  
535 filing inches  
(80,250 cards)



PRICE  
Without lock ..... Cat. #1375-11 ..... \$169.50  
With lock ..... Cat. #1375-12 ..... \$178.50

**4 DRAWER**  
Three-Quarter Suspension  
CAPACITY  
107 filing inches  
(16,050 cards)



PRICE  
Without lock ..... Cat. #1390-11 ..... \$59.50  
With lock ..... Cat. #1390-12 ..... \$66.50

**12 DRAWER**  
Three-Quarter Suspension  
CAPACITY  
321 filing inches  
(48,150 cards)



PRICE  
Without lock ..... Cat. #1385-11 ..... \$115.75  
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Prices F.O.B. Worcester

All new three-quarter and full suspension files, designed and built by the leaders in the data processing accessory equipment field. This line includes all the features our customers have asked for through the years. They are quality files, economically priced.

The tray which fits all files is the basic part of the new line. It gives positive compression, is light in weight and

high sided to protect the cards. Full card labeling and self-stacking too.

In addition to the files shown, a new transfer file will be added soon, to give you the best, but least expensive storage for your inactive records. The same tray will be used.

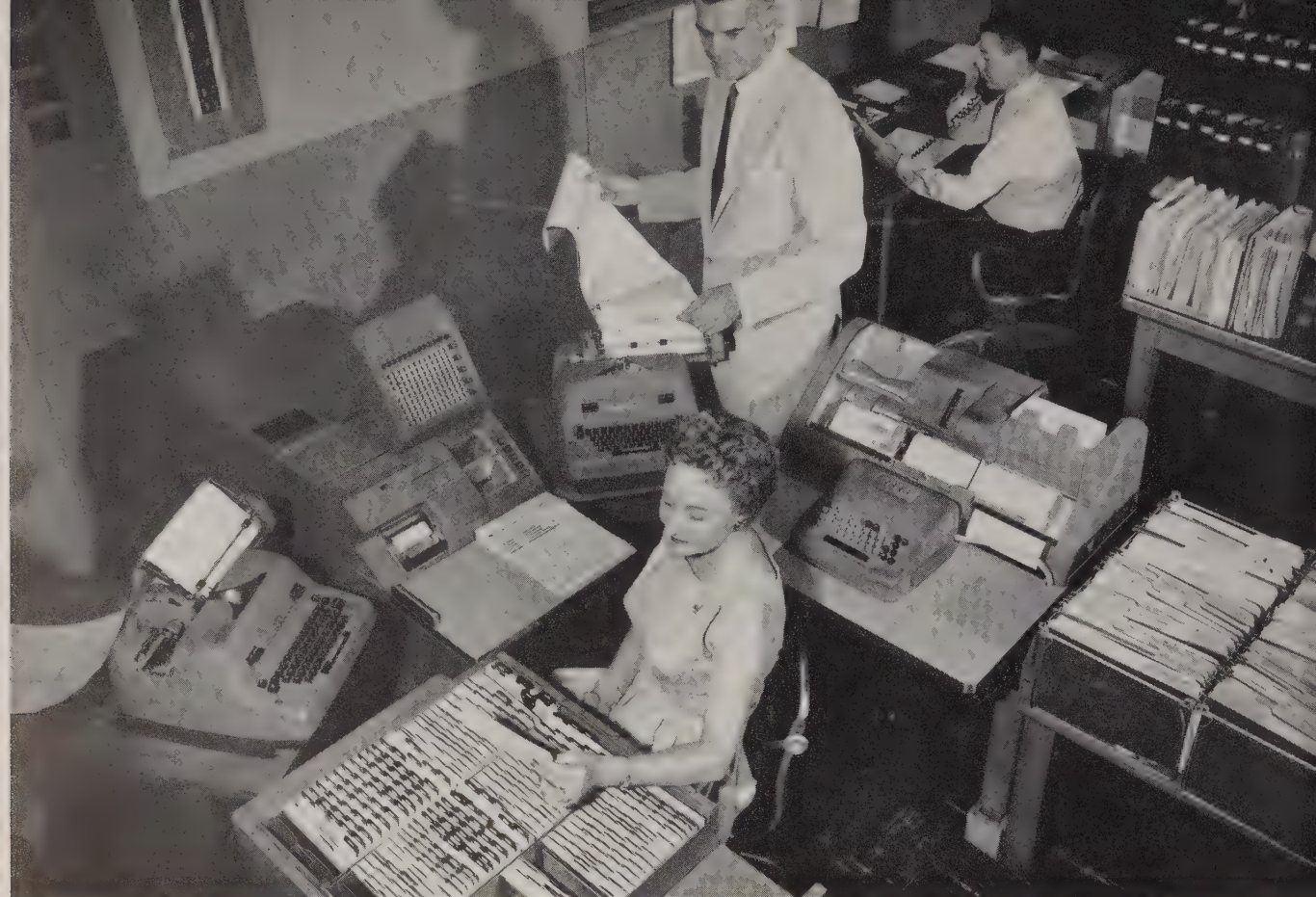
Send for a brochure giving complete details on the new Gold Star line or call your local Wright office.



DIVISION OF BARRY WRIGHT CORPORATION  
WORCESTER, MASSACHUSETTS

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A Cardatype system serves as the heart of the branch inventory control center at the Glendale, Calif., headquarters of the General Controls Co.

## Central Control of Branch Inventory

**F**ORTY-TWO branch and regional offices of the General Controls Co. stand ready to supply spare parts for its products any time a customer needs them. This "after-sale" service is a prime function of a centralized field support program which guarantees uninterrupted service life for products with an absolute minimum of inventory investment by the customer.

Parts for emergency replacement of the many control units manufactured by the company are stocked in every office throughout the United States, Canada and West Germany, and the supply is directly governed by the firm's Branch and Regional Warehouse Control department in the Glendale, Calif., home office.

Activity in this center has been geared to an automated system which keeps full control of commodity inventories in each of the branches as well as recording every product transaction taking

place in these outlying offices. The entire job is handled by one IBM Cardatype installation which, working between 12 and 18 hours a day, processes several thousand transactions each month at the rate of up to three a minute.

General Controls has one of the largest and most diversified lines of automatic controls for domestic, industrial and military use in the industry. More than 400 individual controls are produced in thousands of combinations, and there are multiplicities of electrical current characteristics and other operating differences in the units which create massive inventory problems. In addition to diversification, the company faces seasonal situation. Air conditioner controls, for example, are in peak demand in the summer while heating controls reach a peak in the fall and winter.

Hand posting systems formerly used to control inventory at the various branches were not fast



enough to supply these peak demand requirements without resulting in overstocked conditions during slack seasons and often in loss of sales in the period of high sales volume.

Shortly after the Cardatype system was introduced by IBM five years ago, J. B. Griffith, assistant to the vice president in charge of sales, organized a branch inventory control program with the Cardatype as its hub. His first move was to initiate an intensive study of statistical information and sales volume records to determine the seasonal and annual demand for parts. The results of this survey gave the inventory control department a sound basis for establishing safe minimum levels for every item stocked at each branch. These levels guaranteed immediate delivery of any part.

## Lop-sided minimums

When a transaction takes place, the branch or regional office notifies the inventory control center in Glendale on the appropriate report form—indicating that the transaction is a sale, a transfer of a part from one branch to another, a receipt of a part from another branch, a customer return for credit purposes or a shipment of an “on order” item from a producing plant to a branch office. The incoming forms are grouped by branch and then checked off on a number control record. All documents used by the branches are pre-numbered to insure the continuity of paper flowing into the control center. A number skipped or missing initiates an investigation to determine if the order or other transaction went astray in the mail or was lost in some other manner.

There is a file of punched cards in the control center for each branch, and a card in the file for every item the branch regularly carries in stock. Interpreted on this card is the balance of the item on hand at the branch, the quantity of the item on order (if any), the minimum established quantity, the catalog number and a coded description of the item, the code number for the producing factory, sales of the item during the current year, sales for the past year, and the branch code.

When the Cardatype operator receives the transaction document, she selects the card which corresponds to the catalog number and places it into the card reading unit, manually keying in the code number of the transaction and the quantity.

The Cardatype takes over, and an automatic card punch creates an updated inventory card based on the new information. Simultaneously, a master transaction list is compiled by one of two automatic electric typewriters connected to the main unit. This record shows the transaction code number, the quantities, balances on hand after the transactions, any quantities on order at the producing factory, established minimums for each

part, catalog numbers, sales for the current and previous years, branch number and any unusual information which might be recorded.

If the new balance-on-hand is below the established minimum quantity, a second typewriter automatically fills out a stock order form for the producing factory which, when the part is delivered, will bring the branch inventory up to the proper level. The stock form order has one original and eight carbon copies, which are distributed to various producing departments.

When all of the copies have been processed by the respective departments, they are returned to the home office and checked by the Cardatype operator. If the order balances with the updated inventory card, this is the final step. If there is a change noted, such as in the total number of sales for the year or a new quantity on hand because of receipt of a shipment, she creates a new inventory card for the branch file.

Although General Controls Co. has a large and diversified line of products to stock, the system has given the department a “very near exact” inventory control. A recent check on one warehouse inventory resulted in a small 84-unit difference against 54,000 transactions.

“Larger than average purchases,” Mr. Griffith explained, “such as controls for air conditioners from a volume customer, bypass the branch offices and are handled directly by the factory manufacturing that particular commodity. This is done to avoid a lop-sided minimum supply at some branches.

## Higher quality—Lower prices

“Regardless of the size of the order,” he continued, “replacement stock or an order to the producing plant is on its way within 48 hours after the order blank reaches the hands of inventory control personnel.”

When the inventory control system was put into operation, it was expected to overcome the problem of stocking spare parts. “It has done just that—and much more,” Griffith emphasized, “the machine has provided an increase of approximately four times on the turn rate of the inventory located within the branch and regional office system. During the past five years we have doubled our sales volume, yet we have been able to continue this operation with the same personnel who formerly handled a much lower volume.”

The new system has also played a major role in helping to stabilize production schedules at the several factories, providing continuous employment for personnel in each of these producing units. This, in turn, Griffith pointed out, has brought about a higher quality level at lower prices for General Controls.■



## *Automation Pays a Million Dividends*

**A**UTOMATIC DISBURSEMENT of stock dividend checks to over 1,600,000 stockholders of 185 corporations is saving time—and money—for the Stock Transfer department of the Chase Manhattan Bank in New York.

This service, offered by the bank to its business clients, begins with the simple cutting of a stencil and extends to the point where automatic equipment selects the stockholders who are to receive a dividend check; verifies the amount of the dividend, the stockholder's account number, the company issuing the stock, the class of stock and the dividend number, and then automatically addresses and signs the checks. To handle this job, addressing and comparing machines of the Elliott Addressing Machine Co. have been integrated with Remington Rand data processing units.

The stencils which control the addressing of the dividend checks are prepared on 14 flat-bed Underwood typewriters at the rate of 2,500 a day. These stencils—special 4 by 4<sup>3</sup>/<sub>32</sub>-inch units created by Elliott—reflect the hundreds of new stockholders added to the list or address changes on a daily basis as they flow from the business and bookkeeping department.

The major link in integrating the Elliott stencils with the Remington Rand data processing equipment is a Braun Engineering Co. Puncher. There are five of these machines used to punch a code in the top section of the stencil which records the shareholder's permanent account number, the company (issuing stock) number and the class of stock. In a later step, this information is read by an Elliott Comparing and Addressing unit and compared with data punched into a card check.

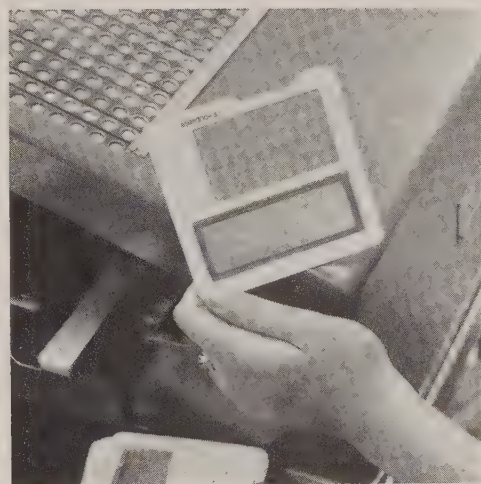


Each of the 10 addressing/comparing machines used in the Stock Transfer Department of the Chase Manhattan Bank can process up to 2,500 dividend checks an hour.

A master punched card, containing the same information coded into the stencil, is prepared for each stockholder. When a dividend is to be paid, these cards are used to reproduce Internal Revenue 1099 forms which are sent to the computer department for processing through the bank's Univac system. After the 1099 form is verified and the dividend computed, a punched card check is created. This includes all of the information necessary for further processing—permanent account number, number of shares owned by the stockholder, the company issuing the stock, class of stock and dividend number plus the amount of the dividend to be paid. The first step for the check is a Remington Rand Interpreter which prints out the identifying account number and the amount of the dividend. It is then ready to be processed through one of the 10 Elliott comparing machines—along with the coded stencils.

The machine first makes an almost instantaneous selection of those stencils coded with the company and class of stock for the particular dividend being paid. It then compares the information on the stencil with that on the check. If this is identical, the check passes under the stencil and the name and address of the shareholder is imprinted



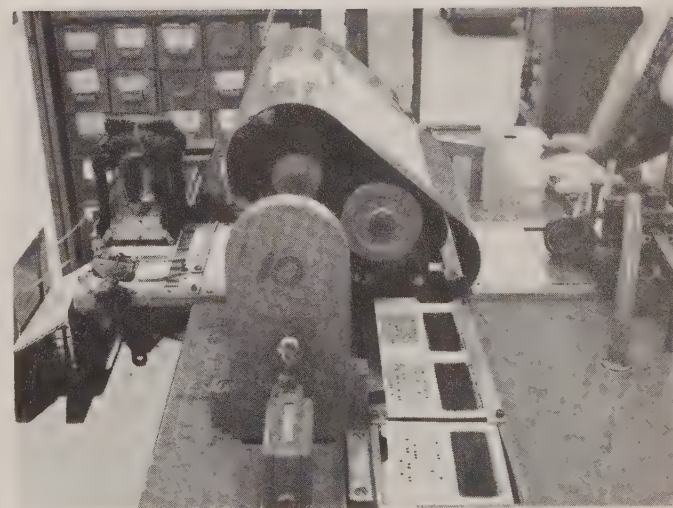


(if there is a discrepancy, the machine stops automatically). Once the stencil does its job it falls into a receptacle, and the check moves on to be signed automatically. One of these Elliott units is capable of processing 2,500 checks an hour for Chase Manhattan.

John Gilligan, assistant treasurer in charge of the production group of the bank's agency division, explains that the system has "virtually eliminated errors," but he indicated that each check is still examined individually for correctness.

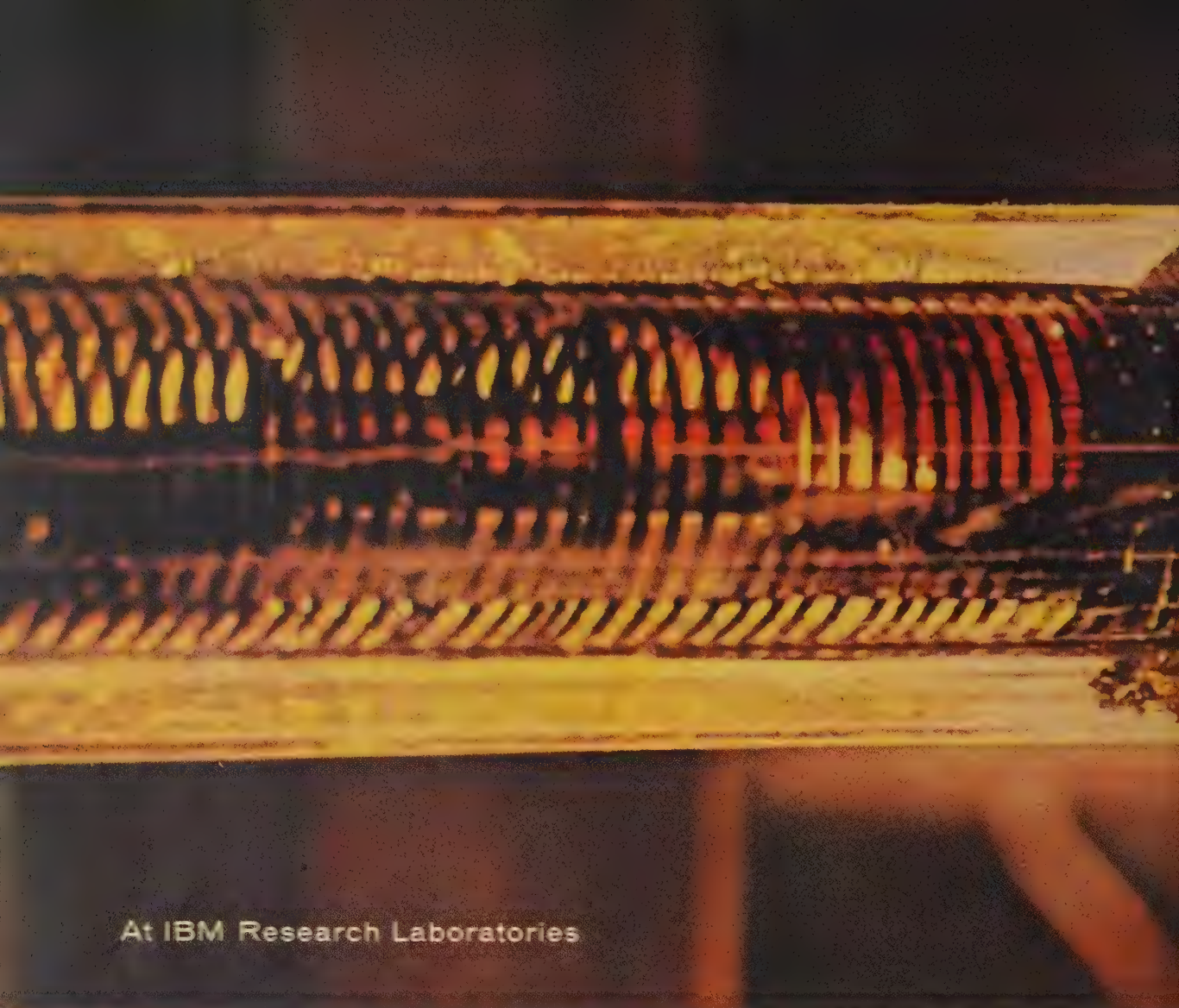
Chase Manhattan has facilities to address the envelopes for the dividend checks and will also mail other communications to stockholders, such as annual reports. This is handled by a bank of six Elliott G-EW addressing machines. The stencils used in the comparing and addressing system are housed in large mobile cabinets which hold 15,000 stencils apiece. These units are moved right to the machine area during a run.

The system was inaugurated in 1952 when the bank began to process its own 80,000 stockholders' checks. In the eight years that have followed, this figure has literally multiplied 20 times to the present 1,600,000 shareholders that Chase now services for its 185 business clients. ■



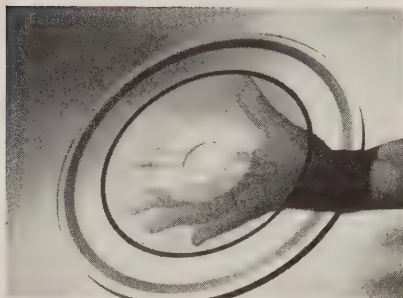
Key information such as account number, company number and class of stock is punched into address stencils by Braun Puncher (top and center photos) and later read and compared with a punched card check by the Elliott addressing/comparing machine.



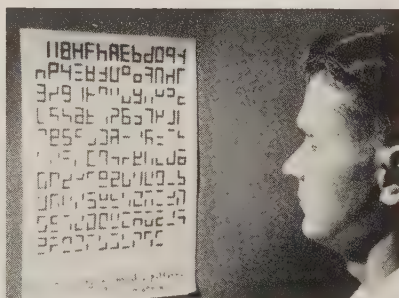


At IBM Research Laboratories

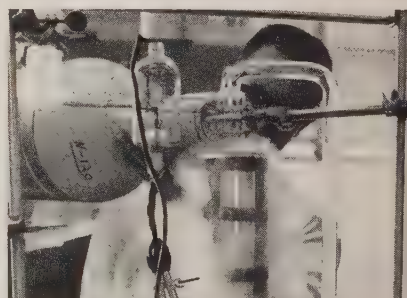
## This "hothouse" grows crystals



**BREAKING THROUGH THE LANGUAGE BARRIER.** An experimental IBM translator developed for the Air Force has been translating Russian into rough but understandable English for more than a year. Above is the machine's rotating "memory" disc. It provides the machine a vocabulary in excess of 2 million words and phrases.

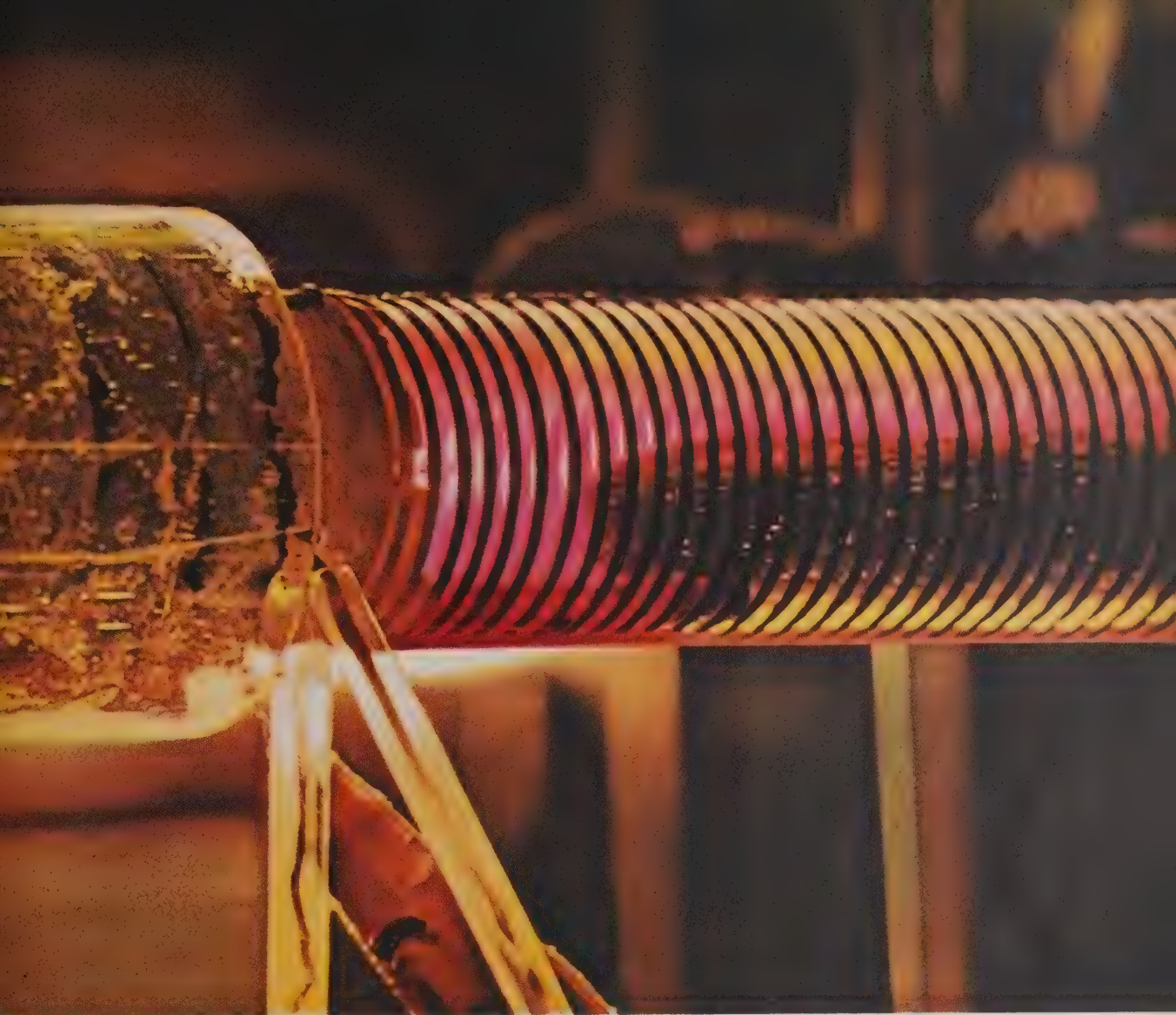


**DESIGNING THE BEST MACHINES FOR MAN'S USE.** IBM Research seeks better ways of bridging human and computer capabilities. Above, a research psychologist studies human reliability and error making in perceiving patterns, including number patterns, one of the many fascinating subjects under constant investigation.



**SUPER-COOLED METALS SPEED RESPONSE.** In general the resistance of metals decreases as the temperature is lowered. However, there are certain metals called superconductors, the resistance of which drops abruptly at a critical low temperature characteristic of the metal. Taking advantage of this phenomenon, IBM researchers have made devices with on-off, or switching, speeds of 2 billionths of a second!





## to shrink future IBM computers

Men have been *making* electronic parts for years. Today, IBM research scientists are *growing* them!

Inside this quartz tube, in an atmosphere of active gases, component parts are built atom by atom, through a process called vapor growth.

It's an intriguing process—but even more interesting is the promise that tiny, vapor-grown electronic components hold for tomorrow's computers. Data processing systems could be smaller, for one thing. And they could do a wider variety of jobs,

work faster, and lower the unit costs of processed data.

"Shaping tomorrow in a quartz tube" is only one of the pioneering and creative projects that keep our research people busy. At the left you'll see some other current projects. All are exciting possibilities for solving problems tomorrow—and all are examples of the technological leadership that helps make possible the advanced IBM systems you use *today*.

**IBM**®  
DATA PROCESSING





## An MBA News Feature

A practical demonstration of the Honeywell 800 system in action was presented at a special preview at the firm's Boston headquarters.

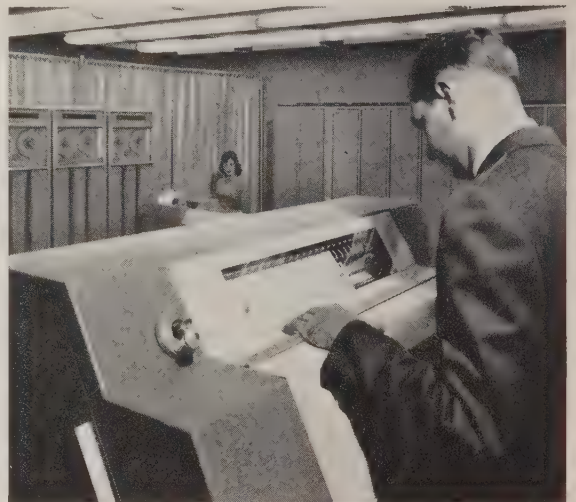
# Honeywell 800 Makes Debut

**T**HE first production model of Minneapolis-Honeywell's new computer, the 800, was demonstrated last month at a special press preview held at the company's Wellesley Hills production facilities. The demonstration included the processing of a 10,000 man industrial payroll in 2.75 minutes, and the performance of eight independent data processing tasks simultaneously — a technique known as "Parallel Processing."

Walter W. Finke, president of Honeywell's EDP division, said that the unusual capabilities of the 800, coupled with the rapid growth of the EDP division, will make Honeywell "one of the industry's foremost producers of EDP systems."

The 800 has an instruction rate of 30,000 average 3-address instructions per second, equivalent to some 65,000 single-address instructions. The core memory will store, or deliver, information at the rate of 167,000 48-bit words per second. Vacuum driven magnetic tape units store, or deliver, 96,000 decimal digits per second, and the high-speed printer will produce multiple copy reports at the rate of 900 lines per minute. The Honeywell 800 is basically an on-line system, but off-line converters are provided in the 800 range of equipments for installations having exceptionally large input or output traffic.

With automatic parallel processing, eight independent program controls are provided for simultaneous operation. Another exclusive Honey-



The high-speed printer of the new 800 system prints out at the rate of 900 lines per minute.

well feature is the error-correction technique known as "Orthotronic Control," which detects and corrects errors in recorded data without human intervention.

First commercial deliveries of the 800 are scheduled this month. Associated Hospital Services of New York will receive the initial system with the second going to American Mutual Liability Insurance Co. in Boston. Monthly rental for the 800 starts at about \$15,000 for a basic system.

The Honeywell 400, a low-cost system with a minimum rental of around \$6,000, is scheduled for production this year with first deliveries in September. Mr. Finke reported that Minneapolis-Honeywell has orders for some \$51 million worth of computers scheduled for 1961 delivery.



*At The First Pennsylvania Banking and Trust Co.*



Above: Independence Hall Office of The First Pennsylvania Banking and Trust Company—bordering on the new Independence Mall.

Left: Console of Burroughs 220 Computer.

## Burroughs Electronic Computer Systems provide total automation

**The scene:** The First Pennsylvania Banking and Trust Company—the nation's oldest and Philadelphia's largest bank; also, one of the first in the nation to be fully automated. **The objective:** Processing all documents and data for this billion dollar bank. **The equipment:** Data processing—Burroughs 220 computer systems. Item processing—B 301 sorter-converters, P 703 amount and account number printers, F 5293 manual converters. **The results,** in the words of Alfred C. Graff, Senior Vice President, Bank Operations: "Their vast experience in data processing convinced us that Burroughs Corporation was best qualified to handle this gigantic, bank-wide job. In addition to invaluable assistance and experience, they were able to provide us with all the equipment—such as our exceptionally reliable computer systems and the world's fastest sorter. As a result, we are already taking full advantage of the advanced magnetic techniques currently revolutionizing document and data processing in banks."

**For businesses of every size:** Burroughs data processing line ranges from accounting machines to complete computer systems. It's backed by outstanding services and systems knowledge, known for outstanding results. **For details,** action—and results—call our nearby branch. Or write Burroughs Corporation, Detroit 32, Michigan.



**Burroughs  
Corporation**

*"NEW DIMENSIONS / in electronics and data processing systems"*

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## Round Table

*Continued from Page 23*

ment, and all creating original documents and by-product machine language.

The computer center will produce action documents, activity listings, exception reports, ledgers, statements, and will maintain files and audit trails. A harbinger of this is the present day unsophisticated add-punch program in use by the public accountants. In recording the detailed activities of a client's business on a simple adding machine, a by-product punched paper tape is generated and sent to a computing center. For the average small client, the accountant is able to deliver completed monthly financial statements, superior in most ways to manual reports, for a fraction of the effort and cost of a hand kept set of records.

### Crystal gazing

The latest, and perhaps the potentially most important, addition to the data originating group is the data collector, a machine that records an event at the time and place it occurs, transmitting the captured data to a central collection point for further processing. The pioneer installations of this type of equipment have generally been on production control jobs, encompassing labor distribution, status reporting, machine scheduling and loading, shortage reports, completion and in-process reports. More recent models are permitting attendance recording and automatic payroll data, eliminating the venerable time clocks from our factories.

These devices promise to bring factory management timely and accurate information impossible to gather with manual methods. Data collection is new, and, while most present applications occupy the factory areas, these unique machines hold much promise for even wider use by the business community. We think that the data collecting devices such as described by Mr. Dean will one day approach the dollar volume of the computing field itself.

MR. SIMMONS: I am certainly

pleased to join this panel today, because it gives me a chance to learn something more on the subject from the experts we have assembled here. But more than that, it offers me the opportunity to do some crystal gazing about the next ten years of office automation. And I am glad to say that I do not view the coming decade with alarm. I foresee great things for the manufacturers of equipment, for the user, for the economy and for the public at large.

### Rear-vision-mirror

I view this decade with great enthusiasm for one major reason: Business automation is crossing from the area of doing faster and more accurately the so-called conventional applications to the exciting realm of doing jobs that only business automation can do. Two examples: Management by exception, where great volumes of data are handled with only the unusual and worthy items highlighted; and simulation, the art of putting a model of business in the computer and then feeding hypothetical questions to the model to anticipate situations long before they actually happen, thus testing many tomorrows to make sure the one chosen will be better than today.

These operations, since they can only be done by computer equipment, have less displacement impact than the automation of record keeping. Their payoff is not the displaced record keeper, but the improved operation. These planning types of operations, which could be lumped under the heading of Management Science, not only provide more controls but provide these controls consistently, filling up the valleys and leveling off the peaks, reducing recession threats and imbalance in the total business world. In spite of my enthusiasm, I see problems, also. The changed techniques, with rear-vision-mirror practices giving way to scientific management, will require a complete re-education of manufacturers, users, all of us.

We will have to be very smart indeed to get this jackpot out of these very smart machines. Although the switch from faster and more accurate applications to scien-

tific management should relieve the displacement problem, it will create human relations problems where jobs are upgraded, requiring training and education. So much has been written about the depressing effects of automation on office morale that we cannot overlook the issue. These articles, whether correct or exaggerations, do reflect an attitude of fear that must be remedied by realistic and forthright action. This is a challenge to everyone, layman and professional, manufacturer and user, computer man and clerk. We can only enjoy the benefits of this second phase of business automation if we face the problems. We must take the responsibility for education, orderly transition, informed and secure working staffs. It is up to us, in meetings like this, to face the issue squarely; to say to these people that we have their fears and concerns very much in mind; that we care a lot more about them than we do machines. We must act on plans for enriching humanity with the new resources of the computer by getting the full benefits it promises without a disruption of employee relations.

### Business by people

MR. HYDE: The word "automation" is a relatively new word to the business world, and a word which denotes automatic. But business is run by people, not by machines. To operate businesses, communication is necessary, and communication is not automatic. During the next ten years, a high degree of mechanization of clerical work is practically certain to be realized on a very wide scale. As has happened in the past, however, the pattern of change will probably be uneven, with the businesses now regarded as alert and progressive taking the lead. The engineering know-how already exists in sufficient amounts to effect a large share of the mechanization needed today.

Now, a study of the organization of information and communication processes and of the technological, social and economic pressures for change in office systems indicates specific conclusions for future office systems. The clerical function will grow, at the expense of executive



function. In the area of inventory control and production scheduling, for example, systems refinements will further reduce the need for executive participation. Mechanization of office systems will experience a greater rate of change. Electronic data handling equipment is moving rapidly into those systems requirements which deal with large volumes of routine information processing, such as the checks already mentioned, stock control of money and goods, retail sales information, and others. Systems of partial mechanization which link standard office machines by tape, telephone lines or microwave systems will advance and gain broad acceptance.

As all data handling systems for manufacture, control and distribution functions improve, and the common and native machine languages better communicate with each other, the most important areas of improvement must be in the information input and output areas to keep pace with the speeds already available in data handling equipment. Because businesses are run by people, not by machines, it is critically important that today's managers of business, and the men who will earn the right to manage in the future, receive fast and accurate information upon which de-

cisions in large and small business must depend for profits and growth.

MODERATOR: In his remarks, Mr. Hyde mentioned that business is run by people, not by machines; and Mr. Simmons referred to the necessity of coming to grips with the problem of automation and its effect on our white collar force. I wonder if this is not a good starting point for our discussion today.

## Over the hump

I think it is certainly true that, in the eyes of the general public, business automation has created an image of job displacement. We see an almost repetitious emphasis on the displacement angle in every press release handled by the daily papers. Frankly I have yet to see a case of any wholesale displacement of white collar workers brought about by business automation. Isn't it about time that we take steps to dispel this false gospel from the public minds? And if we don't, are we not inviting someone like Mr. Hoffa to organize the white collar workers under the phoney claim that unless they unite they will be wiped out by computers and such? One other thought before we discuss this situation—what about the equipment manufacturers' respon-

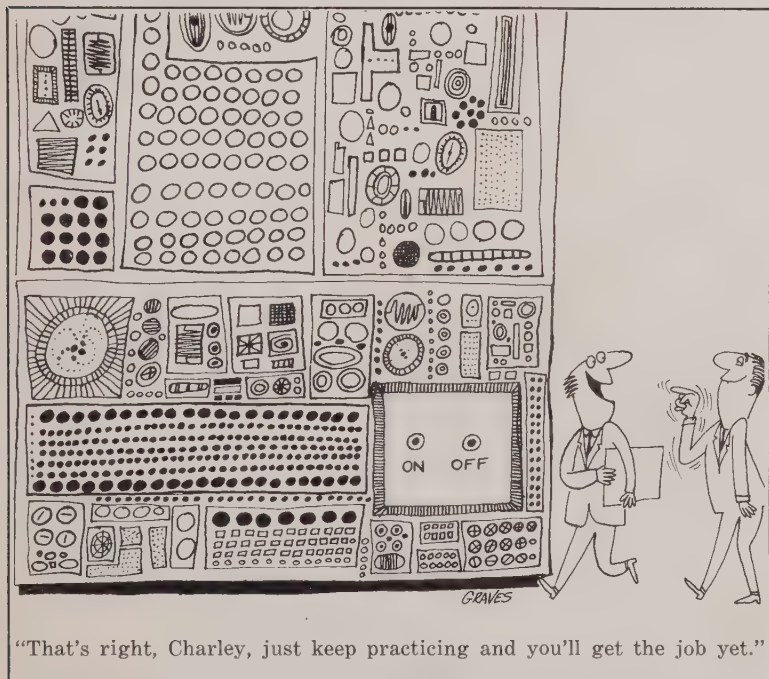
sibility? Have they not contributed to the displacement theory with their proposals to management claiming that the system involved will eliminate certain groups of personnel?

MR. SIMMONS: Well, I might say that a little research in the area has been done, some of which may be accurate and some may be inaccurate. The National Office Management Association studied 369 companies using office automation and found that of more than 2,500 persons whose jobs were affected by the introduction of new equipment, less than one percent (19 people) were laid off; most employees were integrated into other departments, while a good number were retained to operate EDP devices. There are many studies like this that present a picture where attrition takes up, or switches in jobs take up, the slack that has been displaced by the installation. I think the thing I was trying to stress in the ten years ahead is the fact that the new users of computers have much less of this impact, and I believe we are over the hump on this part of it.

## The brain bit

MR. RYAN: Well, I don't agree wholly with Mr. Simmons. I think that each of us in the office equipment field, at least when we make our proposals, definitely indicate that we are going to replace people. We can talk in other terms, but this is really what we are talking about when we make a proposal. We have to have an economic justification to have our customer buy that piece of equipment. I think that definitely the automatic equipment is going to speed the unionization efforts at the office level just as it does at the factory level.

Incidentally, I think back in the 17th Century that the peasants in Flanders took off their sabots, or wooden shoes, and threw them into the industrial machines that were being introduced at that time, and coined the word "sabotage." Hopefully, present day clerks won't be throwing their desk calculators in computers. The most recent example, of course, is the 20th Century peasant from Russia who took off his shoes and threw them into the



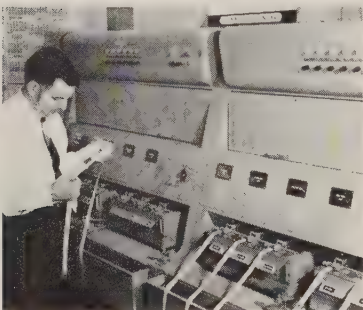
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# PROBLEM: to reduce truck "wait-time"...put Middle Atlantic shipments on "load-and-go" schedules

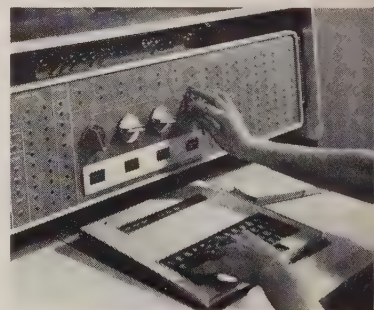
HOW WESTERN UNION SYSTEM KEEPS 14 TERMINALS UNDER ONE ROOF



*Cargo Information* speeds from New Britain switching center to any Middle Atlantic terminal in seconds. And everything's *in writing* . . . no mistake about it!



*36 Hours In Advance*, terminal managers get all necessary papers and forms; plan ahead for truck's arrival. Result? Faster service for every customer!



*Using Original Tapes*, punched card-computer systems process invoices, management data, profit-and-loss information. System prepares payroll for 800 employees.





# SOLUTION:

## A Western Union Private Wire System

*Interested in streamlining every area of company communications, and in eliminating costly waste-time? Here's how Western Union helped solve both problems for Middle Atlantic Transportation Company.*

Under the old system, trucks were held up while way bills and manifests were being prepared manually. Average "wait-time" per trip was a serious four hours . . . multiplied by 25,000 trips per year!

The solution? A Western Union Private Wire System, engineered to coordinate with Middle Atlantic's advanced data processing installation.

Today, this versatile private wire network—transmitting 400,000 words per day—links New Britain, Connecticut, general accounting offices with 14 Middle Atlantic Terminal points in eight Eastern and Midwestern states.

Contact is instantaneous . . . and always *in writing*.

Cargo data, way bills, dispatching information . . . all data can now be sped "down the line" in seconds. Terminal points get information as much as 36 hours before the truck arrives. Result? Faster, more accurate planning, speedier customer service. Improved "load-and-go" schedules help *save an average of two to six hours per trip!* And, by using custom-engineered private wires, whereabouts of consignments can be determined *in minutes*.

Your company can probably benefit from a Western Union Private Wire System. It will be custom-tailored to your business alone . . . handle all company data with error-proof, *written* accuracy. It can save you time . . . and money. For all the facts, send a collect wire to: Western Union, Private Wire Division, New York, N. Y.

**WESTERN UNION** . . . *first in Private Wire Systems*

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## Round Table

Continued from Page 39

machinery in a New York factory.

MR. SMITH: Well, I am very much inclined to take Mr. Simmons' point rather than Mr. Ryan's. We notice two things. There is no question but what in the original mechanization of a manual payroll to a punched card payroll there was, without any question, a replacement of people. As the data processing operation becomes more sophisticated, we are trying to solve a management problem rather than make a clerical savings. And, for example, at the Metropolitan Life Insurance Company, at the time that they installed their first computer, they had 1,200 open requisitions for clerical help which they couldn't fill. And this was one of the reasons why they installed computers.

MODERATOR: Using your insurance company illustration, Gordon, I would guess that the papers probably played up the installation as a "giant brain" type of thing. Personally, I think the "brain"

cliche has done more to confuse and frighten the average worker than any other aspects of business automation. We notice that even middle management people are beginning to wonder if there is any future for them, what with machines being played up as tomorrow's decision makers. Don't you think we should eliminate this brain bit from the manufacturer's commercials?

### Pretty monsters

MR. SMITH: Well, respecting the two points you make, the first one is, I think, one of the things we have learned to do, is to cooperate with the user in an educational program to alleviate the fear and to have an orderly rearrangement of personnel. I think that it is inevitably a rearrangement of personnel. On the question of the brain, we have pretty well given up. We still tell the people that the machines are idiots and they have to be run by smart people, but I doubt that we will ever—particularly in the field of simulation, where the machines are doing remarkable things—dispel the idea that they are pretty brainy machine monsters.

MR. DEAN: I would like, first of all, to defend the manufacturers, not that they need any defense; but certainly it isn't the manufacturers' fault that the emphasis has been on displaced cost. This is the fault of the management of the potential user. This is what he wants to see, and what he has to justify to his board of directors.

As management consultants, we are very aware of this and we have tried to de-emphasize this displacement of cost and talk about the things that the machines can do. The system really can do the explaining. The systems can do things which cannot be done today. But you will find that many of our corporate managers consistently go the route of thinking "how much longer will we be needed" and it's cliche thinking.

Let's not blame the manufacturer, because I don't think they should be presenting the cost savings in the first place. They don't know the user's organization that well. This is a job either for the user or some outside agency. But I tend to agree

with Mr. Keller. I think we should emphasize the things that the machine can do which the humans could never do, rather than the fact that the machines are going to displace the means. I think the simulation and the future uses of computers in the way of producing reports, which human beings could never do, is the place the emphasis should be placed.

One last point is that we keep talking about the people being displaced in data processing. It's really a question of absolutely needing this equipment in the clerical field. It has been pointed out that unless we make the check handling function automatic by the year 2100, there won't be enough clerical employees in the country to manage this operation. The future growth and employment is not going to be in the producers, it's not going to be in manufacturing, it's going to be in the services and clerical area. So let's not blame all the social ills on clerical automation.

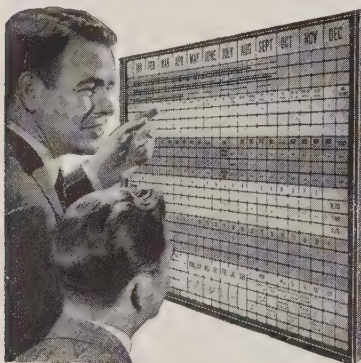
### Revolution or evolution?

MR. WIKER: I think when we start talking about the human effects of automation, the thing that we should remember, first of all, is that the business automation is not really a revolutionary occurrence where yesterday we were unautomated and today we are completely automated. It is more or less an evolutionary process that has been growing and will continue to make steady growth with certain peaks of elevation. But I really believe that, as in the past, the need for information and the increase in the paperwork requirements probably is going to be all that the manufacturers can keep up with, and probably there won't be any serious drop in employment.

I think that there will have to be a re-education of people and transfers from certain types of jobs to other types of jobs. The need for information to run a business will result in no great displacement of people. Certainly—as Mr. Simmons pointed out, there hasn't been any radical displacement up to now.

*The MBA Round Table will be concluded in the February issue.*

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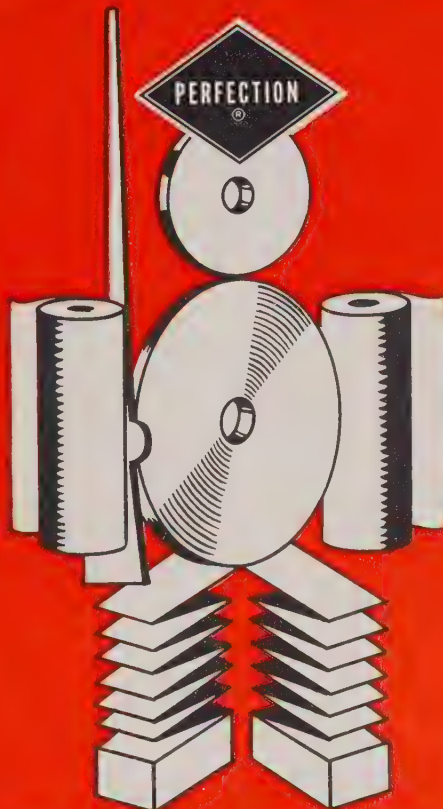
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## Johnson's Wax

*Continued from Page 28*

The computer prints out daily, weekly and monthly sales progress reports. A key product sales trend is prepared daily. A geographic sales report by area, district, region, nationally and by country is prepared weekly. Sales progress reports for national accounts, for volume and major accounts, for key accounts and by classes of trade are produced monthly.

And, as Johnson's gains experience, the programs will be refined. For example, in handling inventory, the 304 now carries a low limit for every product in every warehouse. Whenever a change occurs, the computer compares the amount of the affected product in stock at that location where the limit is low. If the amount is below this limit the condition is indicated and rectified, but static low limits are sometimes unrealistic. The demand for an insecticide, Raid, varies with the season. Eventually, provision will be made for the limits to fluctuate with the factors which influence demand. Similar improvements will be made in other programs as soon as it becomes practical.

## Painstakingly answered

The actual plans for converting from a tabulating system to the computer were laid out from A to Z before the first step was taken. Supervisory personnel beside Kidd and Whisler included Otto Huebner, the data processing manager; Roger Thornberg, the computer operations supervisor; Ralph Janusiak, the computer data supervisor who handles all data up to computer and also the reports coming out; John Harrits, the data input supervisor who supervises the wire room and the adding machine input at Racine; and John Ambruster, the programming supervisor who has four programmers in his group.

All individuals connected with the EDP system were involved in the detailed planning, coding, and other functions throughout the conversion. Otto Huebner points out that the specific details of file conversion often do not receive sufficient

consideration when a company is studying a computer system. For example, these questions need to be painstakingly answered: What information is required? How can this information be accumulated? How will the information be stored during the conversion? What is the best format for storage? How can the files be updated? How can the files be checked to make certain conversion is made correctly? How can the data be verified after conversion is complete?

## Control of workmanship

At Johnson's, all possible contingencies were anticipated, which allowed the conversion of all punched card records to magnetic tape to be made in one night. An NCR card reader, capable of reading cards at the rate of 2,000 per minute, was leased for the conversion.

It is a truism to say that Johnson's must deliver data to the 304 in a standard format, and that the original data must be correct. Bad data can be detected eventually, but a high volume of exceptions and errors in the data processing stream produces sluggish operations, late reports and generally ragged results. Thus, the reliability of the 304 system has important practical advantages.

Johnson's has established the following general network of controls: (1) internal computer controls; (2) internal program controls, and (3) conventional accounting systems controls.

Phrased in another way, these controls could be classified as "control of raw materials" and "control of workmanship." Is the data good? Have the individuals connected with the system performed correctly?

Internal computer controls provide guarantees of tape accuracy, and they insure the reliability of other computer functions.

In any EDP system, the only way to be assured that the recording on magnetic tape is correct is to read the tape and test its correctness. The time this check should be made is immediately after the information has been recorded, since only then is the correct information still available in the processor memory.

The National 304 system automatically reads and checks the

## Profile of the '304'

The NCR 304 electronic data processor is a high-speed, solid-state computer designed specifically for business and other high volume applications.

**Magnetic Tape System**—reads and writes at speeds up to 30,000 characters per second. A tape reel contains 3,600 feet of alphabetic, numeric or alpha-numeric information stored at 200 characters per inch. The tape file provides for variable record length with no wasted space between records; over eight and one half million characters can be stored on one reel.

**Paper Tape Reader**—reads any code at 1,800 characters a second.

**Punched Card Reader**—reads 2,000 cards a minute.

**Printer**—prints at the rate of 680 alpha-numeric lines a minute, skips at the rate of 5,040 lines a minute. There are 120 characters to the line.

**Central Processor**—24,000 or 48,000 memory positions.

**Paper Tape Punch**—punches 3,600 alpha-numeric characters per minute.

magnetic tape during the recording process. The read-checking of magnetic tape recording is performed by a reading head located on each handler, immediately behind the writing head. As newly recorded information passes under the reading head, it is read and checked.

## No "patching"

Programming checks are built into each separate program. Input data is validated and "illegitimate" transactions are screened out. For example, in order processing, a hash total of all numbers on a particular transaction is accumulated by the tape-punching adding machine in the branch. The operator makes a simple repetitive check by subtotaling and then subtracting the same numbers out to a zero proof. Batch totals are kept in the branches, and a sequence check of transaction numbers accounts for all transactions on various punched tapes to provide transmission message control. The original transaction number identifies each transaction on all output forms throughout the system.

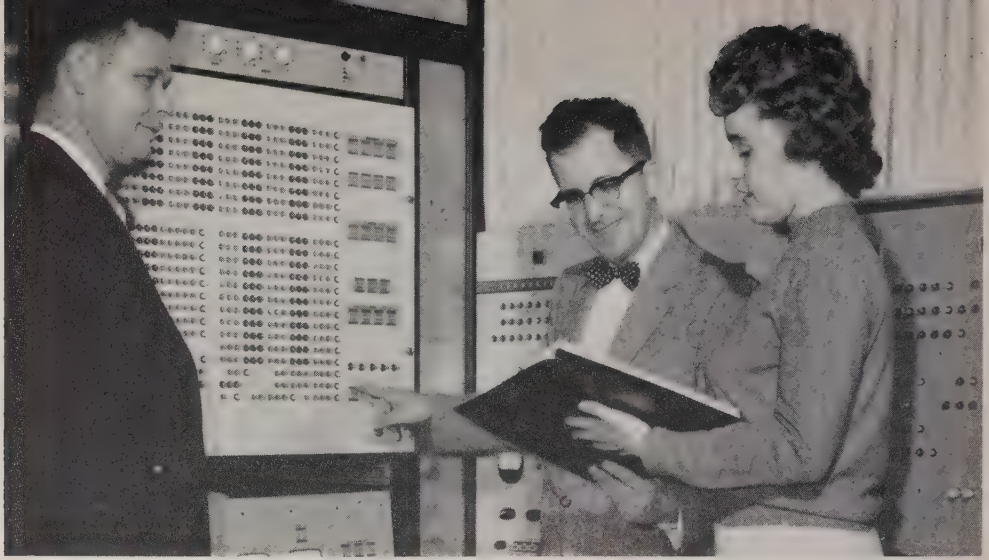
The hash totals of all transactions







## An MBA Product Preview



Dr. V. E. Herzfeld, center, manager of Real-Time engineering for Univac, checks the engineering log before applying power to the central processor control of the New 490 Real-Time computer. With him are, left, P. J. Spillane, manager of production and Janet Beckman.

## *Thin-film Memory, Real-Time System Introduced by Univac*

**T**HE first computer to employ thin-film memory, and the first real-time computer system have been announced by the Remington Rand Univac Division of Sperry Rand Corp. The Univac 1107 Thin-Film Memory Computer was described by Dause L. Bibby, Remington Rand president, as the "break-through making possible a whole new generation of computers that operate in nanoseconds (billionths instead of millionths of a second), opening the way for greatly improved performance in commercial, scientific and military computers."

Thin film computer memory consists of a series of metal dots, a few millionths of an inch thick, made by depositing vapors of iron, nickel, cobalt, or other ferro-magnetic metals on their alloys, on a suitable sub-strate, such as a thin glass plate. The film was perfected by Remington Rand Univac scientists after seven years of intensive research for a new material and design which would give computers a small-size, rapid access internal memory.

The Univac 1107, a medium-scale, solid-state data processing system, was designed and developed to solve both complex problems off-line and real-time problems on-line. It employs several internal features which enable the user to gain additional speeds beyond those built in by electronic circuitry. These features include 16 arithmetic registers, 15 index

registers with automatic-incrementation, and partial word transfer capabilities. The 1107's film memory makes it possible to retrieve information from memory 1,500,000 times per second, compared with only 500,000 times per second attainable with core memories.

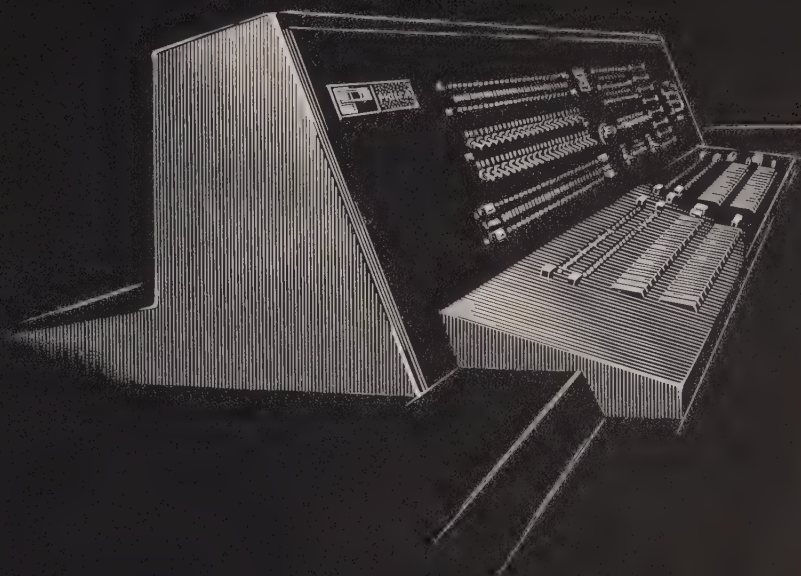
In addition to the 128 word film memory, the system has a ferrite-core memory of from 8,192 to 65,536 words, depending on the user's requirements. Cycle time required to read and write information from the thin-film memory is only 0.6 microseconds, compared with 1.5 microseconds from ferrite-core memories.

The Univac 1107 computer requires comparatively small floor space. A typical configuration actually occupies only 150 square feet. The system is reported to be lower in cost than less advanced equipment. Rental charges range from \$40,000 to \$60,000 per month. Delivery is 18 months to two years following the order.

The Univac 490 Real-Time system is the first data processing and communication system supplying facts and results on a "real-time" basis (computer operation that is simultaneous with an event such as controlling and altering the trajectory of a missile in flight). In a combined inventory and production control application, the system can exercise continuous and instantaneous control over complex company operations nation-wide in scope.

Standard components include the central computer, supervisory control panel, remote input-output sets, high-speed communication control unit, programmer scanners that control communications between remote locations and the central computer, expandable magnetic core and magnetic drum memory units and Uniservo magnetic tape units. The system has an internal ferrite core memory of up to 32,768 words. Rental is \$20,000 to \$40,000 per month. Circle No. 117

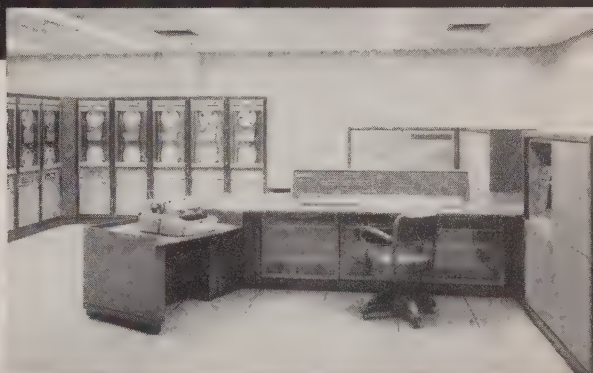




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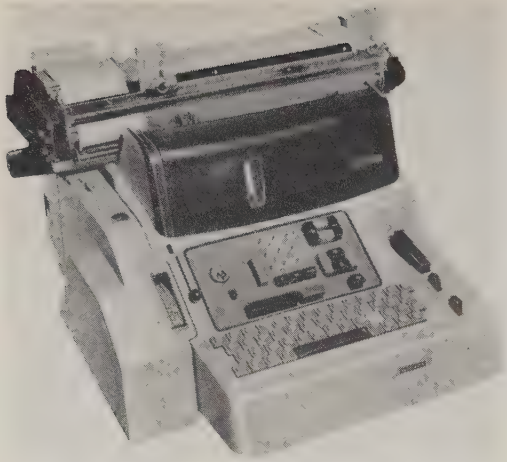
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Model 733 is one of Underwood's Data-Flo Accounting Machines which have a built-in tape perforator.

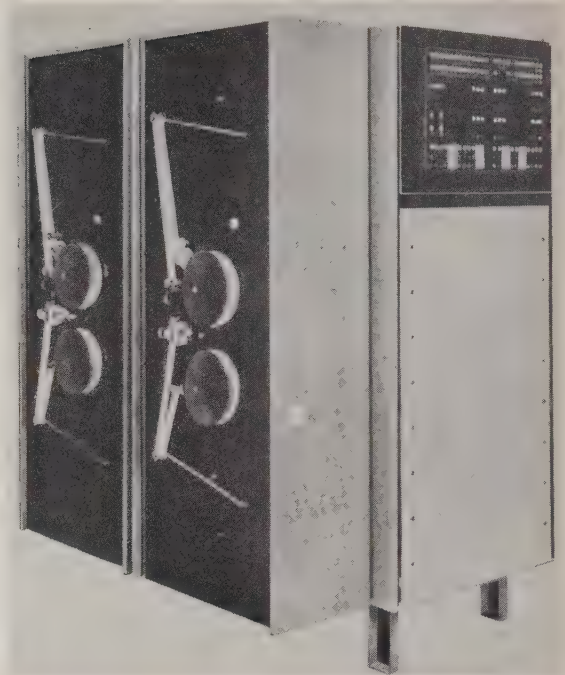
## *Underwood Shows Data-Flo Data Processing Line*

**T**HE NEW DATA-FLO line of data processing equipment, from the Underwood Corp., includes accounting machines, a paper tape to card converter and a tape to magnetic tape converted selected by the manufacturer for the line's initial introduction. Underwood officials disclosed that 2,500 such machines have already been sold in Europe.

The accounting machine has been designed for use at central or widely scattered locations for the preparation of original documents or to perform initial accounting functions while capturing essential data on paper tape for further automatic processing.

Major features include the ability to program the machine to control the accounting functions performed. Underwood Data-Flo Accounting Machines now have the tape perforator as an integral part of the basic equipment. Direct mechanical connection between the operating keys, encoding units and the punch assure absolute punching accuracy. A variety of numeric and alpha-numeric models are available to meet a wide range of application requirements.

The Data-Flo Tape to Card Converter is designed to complement the accounting machine by providing a means of producing punched cards



Underwood's Data-Flo Tape to Card Converter produces punched cards at rates up to 7,200 per hour.

from paper tape created on the peripheral units. Cable connected and synchronized with a summary punch, the converter produces 80 column cards at rates ranging from 6,000 to 7,200 per hour depending upon the type of punch employed. Operations are under program control. The paper tape is read photoelectrically at the rate of 800 characters per second and checked before card punching. Each card is verified automatically after punching.

The Data-Flo Tape to Magnetic Tape Converter is designed to satisfy the conversion needs of these organizations employing magnetic tape instead of punched cards. Cable connected to a tape drive unit, it records data on magnetic tape at the maximum speed of the Data-Flo Tape reader—800 characters per second. Various models are available to meet the differing requirements of the several makes of computers. Safeguards have been built into the equipment to assure accuracy. Paper tape is read twice and checked. Data is edited and directed to a magnetic core memory where it is checked for parity before read out. After recording, the magnetic tape is further verified by a read back operation, which includes character count for comparison with memory contents.

These are forerunners of other machines that will reach the market soon. Circle No. 101



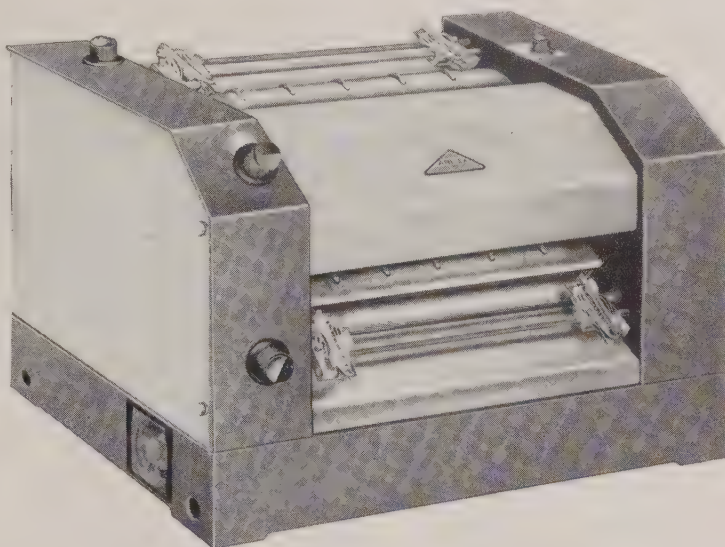
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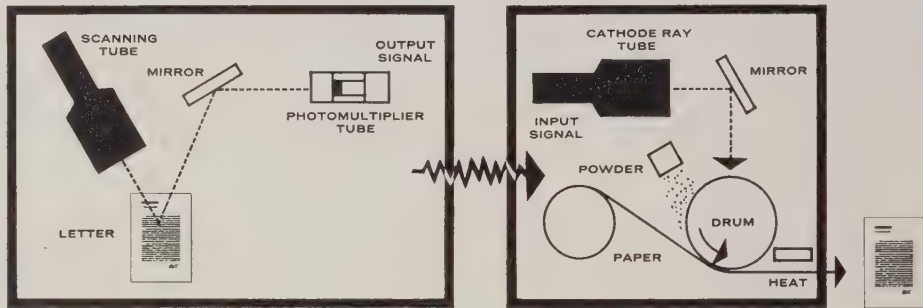


## An MBA Product Preview



A typewritten document, placed in the scanner at the right, can be transmitted by microwave or cable to a facsimile printing unit, left, and printed out in seconds.

# *Develop High-speed Facsimile System*



**A**N ELECTRONIC READING and printing system, capable of transmitting letters, reports, drafts, charts or photographs from one point to another by microwave relay, has been developed by Stromberg-Carlson—San Diego, a division of General Dynamics Corp.

The system, which has many future application possibilities for private use in business and industry, is now a major link in the prototype Speed Mail system now being tested by the Post Office Department.

It is based on the principle of facsimile transmission which enables a letter or other document to be scanned electronically so that the image can be sent by high-speed microwave to remote points where exact reproductions are made.

The specific contract with the Post Office resulted in the system illustrated above in simple schematic form. The document to be sent is fed into a facsimile scanner (left) where it is scanned by a small spot of light generated by a cathode ray tube. Light reflected from the sheet is picked up by a photo-multiplier tube and converted to an

electrical signal which can be transmitted by standard TV-type communication lines. At the receiving end, a facsimile printer (right) picks up the incoming signal and reproduces the material as originated on the face of another cathode ray tube. Printing is accomplished at high-speed by the xerographic printing process of Haloid Xerox, Inc., incorporated into the SC unit. This is claimed to be 400 times faster than the facilities of the major press associations for transmitting pictures.

Another advantage of this high speed facsimile transmission is the compactness of the equipment, which requires modest floor space. In addition, the system is designed to pick up virtually any color, although it prints in black only. A Stromberg-Carlson spokesman stated that this is the lowest cost facsimile system yet developed.

Although no other governmental or commercial applications have been announced as yet, it is expected that they will be announced after the Post Office system has been fully tested. Circle No. 115

# MBA Showcase

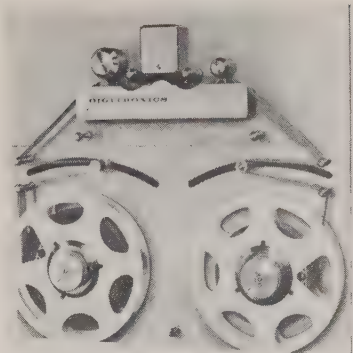
## New Products for Business Automation

### Rapid Look-Up System



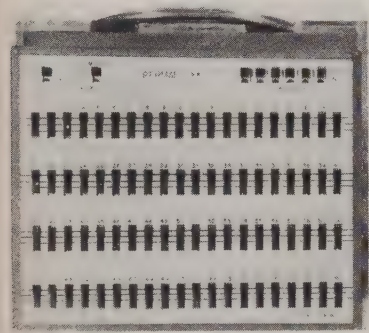
The Rapid Access Look-Up System, introduced by Ferranti Electric Inc., is designed for item look-up by proper page selection and projection on a screen. The system employs a 16mm. film loop driven at a speed of over 40 inches per second. Each frame of the film includes a catalog page and an alphabetic-binary code for page identification. Up to 5,000 pages can be accommodated. Economical employment of the system may be effected wherever continuous or frequent catalog or record look-up is required. Such fields might be; order-entering, price confirmation and in parts inventory records for manufacturers. Circle No. 110

### Paper Tape Handler



A new bi-directional perforated paper tape handler, offering an economical method for the handling of large quantities of tape at high speeds, has been announced by the Digitronics Corp. The new handler, DYKOR Model 4566 "Servo-Spool," permits forward or reverse reading of perforated tape at speeds up to 400 characters per second, and rapid rewind at 1,000 characters per second. Eight-inch reels, which hold 500 feet of tape, are controlled by a three-zone contactor system. Circle No. 124

### Permanently Wired Panels



The addition of Permaflex panels to Tech Panel Co., Inc.'s line of control panels, wires and accessories for data processing machines has been announced by the manufacturer. These Permaflex panels are permanently wired, making it possible for tabulating machine operators to switch operations without removing or inserting plug wires, thus saving time. The pre-wired Permaflex unit is built into a standard Tech panel and tested to perform the function required in reproducing punches. The panel features four position slide switches. Circle No. 112

### Completely Dry Electrophotographic Photocopier



"Electro-Stat" is the name of American Photocopy Equipment Co.'s new desk-top photocopy machine, which employs a completely dry electrophotographic technique. The new process, licensed from Radio Corp. of America, was developed for use in the device by APECO's research laboratories to get an exact repro-

duction of any document or photograph in a few seconds. Business documents, even those using halftones, solids and colored material, can be reproduced in sharp black and white at a cost of 3½ cents each. Every "Electro-Stat" copy can be used as an offset master. Circle No. 105

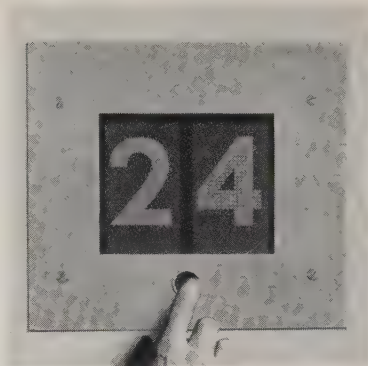


## Rotary File



A new horizontal rotary file, "that grows with the need," adding up to six times its original capacity without expanding floor space, has been introduced by the manufacturer, the Wassell Organization Inc. The revolving-tier Speedline model of the Wassell Corres-File is the newest in the company's line. Records are filed radially around a hub, and balanced so that finger tip pressure swings the desired file into position. One "Rotor-Tier" at a time can be added, up to six tiers on the same base of 48 by 42 inches; four file drawers to the tier. Circle No. 121

## Telescreen Annunciator



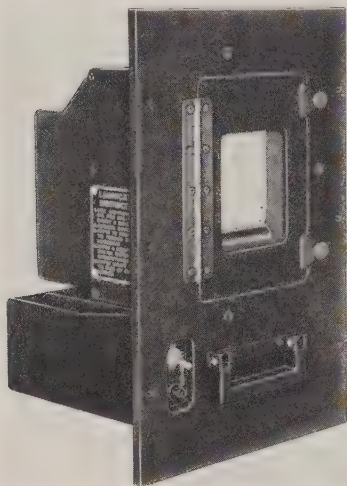
A telescreen signaling system, featuring a miniaturized annunciator capable of indicating up to 100 different numbered signals in a space no larger than seven inches square, has been introduced by Auth Electric Co., Inc. The system is designed for use where the needs of a large group of individuals, such as office executives sharing in a stenographic or page pool; buyers interviewing numerous sales people; or security guards calling a central station, can be served without the necessity of installing large annunciators. Circle No. 122

## New Model Bursters



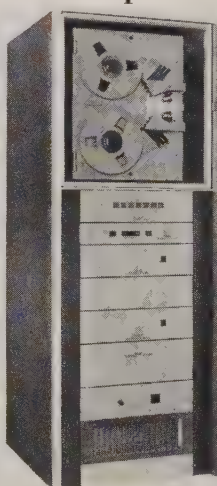
New safety features, better appearance and quieter operation are significant features of the 1961 model burster and burster imprinters by Uarco Inc. A plastic guard installed over the trimming units adds protection to operators hands. If the guard is raised, the burster stops automatically. The "on" button has been recessed and the "off" button has been raised. Side panels go to the floor for safety, appearance and to reduce operational noise. Circle No. 123

## Militarized Printers



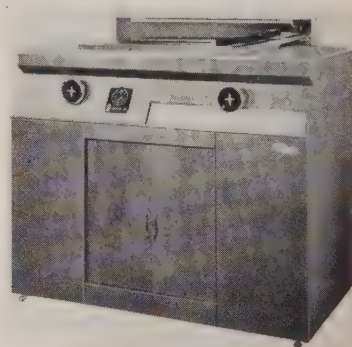
Printers, designed to provide reliable printing of digital data under extreme environmental conditions, such as encountered in the military field, have been introduced by the Clary Corp. Reliable printing of digital data is assured on the Model 2000 Printers which are constructed on a sturdy panel for vertical mounting in a rack, and contain all necessary electronic equipment for the printer's function. Circle No. 103

## Compatible Tape Handler



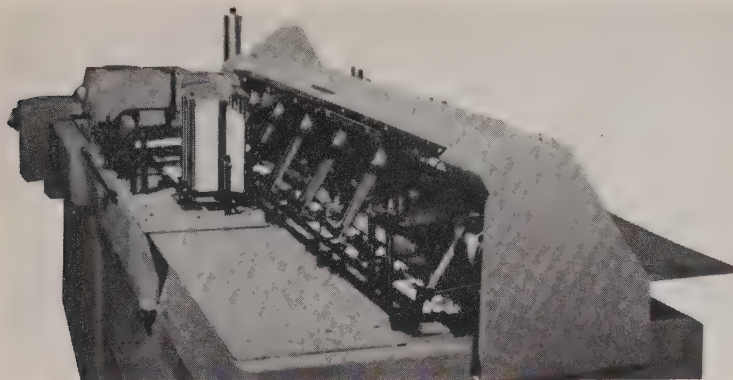
A successfully tested digital magnetic tape handler designed to be compatible with any of eight different computers was announced by the Potter Instrument Co. The equipment consists basically of the Potter 906 II high performance tape handler and a field conversion kit that quickly adapts the handler for data translation with a specific computer. Circle No. 113

## Vertical Camera



A new vertical camera introduced by Lacey-Luci Products, Inc., is specifically designed for use with Ektalith and Gavaert copy processes, as well as for normal commercial business needs. Called the Vertical 14, it may be used as a darkroom or galley camera and has metal frame construction with top and panels of acid-resisting formica. An automatic reset timer has an accurate calibration system. The interior is designed to give freedom from glare and lens flare and fingertip control. It takes little floor space and the enlargement-reproduction capacity is 250%. Circle No. 108

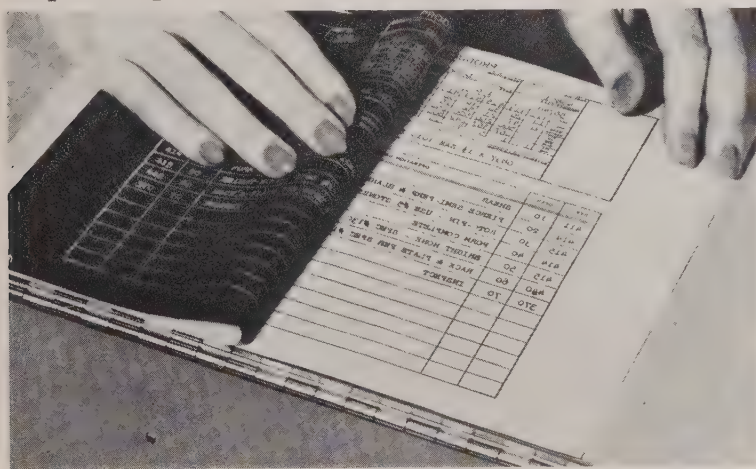
## Complete Mailroom Facilities on Single Machine



Automated mailrooms, in the form of a single machine, have been introduced by Bell & Howell Phillipsburg Co. The new equipment prepares 4,500 mailings per hour and is said to be the first machine to automate punch-card billing for department store and service station charge accounts. It also features automatic feeding for variable inserts with a device that uses compressed air and mechanical "fingers" to distribute bills and charge slips into proper envelopes. Designed to handle any type of stand-

ard punch card, the equipment also stuffs up to eight additional pieces of mail into the envelope if desired, then seals it, adds correct postage and stacks envelopes for mailing. It is a special model of the company's Expediter series, and it eliminates the manual feeding of variable inserts. In one operation, mailing up to 125,000 current statements a month, it can gather these records, a return envelope and up to four advertising folders, seal and stamp envelopes at the rate of about 6,000 per hour. Circle No. 104

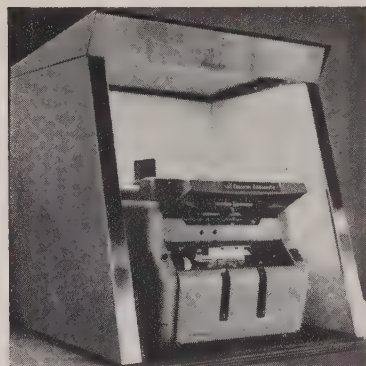
## Duplicating Master By Heat-Transfer Method



A specially developed fluid duplicating master, made on a conventional heat transfer office copying machine in the time it takes to make regular copies, has been introduced by A. B. Dick Co. Used by the company's Azograph or other machines, the master creating process can take any number of masters from suitable printed, typed, written or drawn originals. Up to 50 copies can be produced from each master with a

fluid duplicator. Among tested applications which have already found the method useful are engineering paperwork, tabulator and automatic data processing output material, teletypewriter messages, accounting reports, export manifests and source documents for air mailing. The method can also be employed to reduce parts of a snapout set and/or obtaining additional needed copies. Circle No. 107

## Soundproofing Cabinet



A soundproofing cabinet, to be used by purchasers and users of Cummins-Chicago's Cansamatic automatic feed perforator used in cancelling checks, is released and custom built for the machine by International Sound Control Co. The manufacturer says that the new sound cabinet cuts down 50 percent of the Cansamatic machine's noise and is designed for use in critical areas where a quiet atmosphere is imperative to error free work. It will be available on an optional basis to Cummins-Chicago customers. Circle No. 125

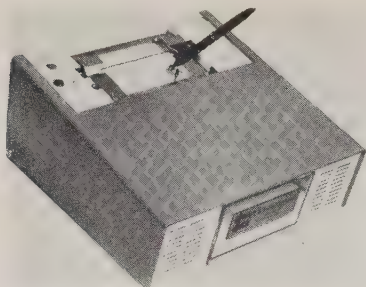
## Telephone Answering Set



A new transistorized telephone answering set has been developed by Electronic Secretary Industries, Inc., subsidiary of General Telephone and Electronics. The all-tape operated Model LP (Long Play) will record messages of varied lengths up to one hour's duration (two-hour capacity also available). The unit, connected to the telephone line, is of modular construction in three sections: Cabinet, designed by Raymond Loewy; transport mechanism, containing tape deck, motorboards, speaker and motor control; and chassis, housing power supply and basic switching apparatus—three plug-in printed circuit boards. The unit records messages with or without the operator present. Circle No. 118

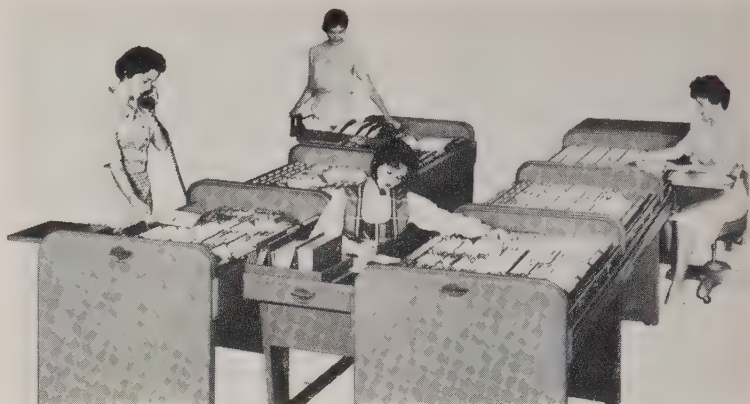


## New Telescriber Line



Improved operating and control systems will be made possible through the use of a new line of telescribers introduced by the TELautograph Corp. The instruments, known as Model D telescribers, are expected to increase the scope and usefulness of handwritten wire communications. Key advantage of the new system is that the operator writes directly on paper. Another feature of these machines enables a user to create carbon copies on the transmitting unit. With the units, any transmitter in a system may create up to four copies of a message, three copies and the original. The Model D units can function in a radius of up to 50 miles. Circle No. 114

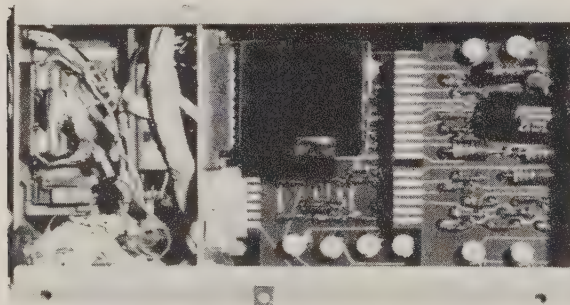
## Cycle Billing Record Handling Equipment



A new system of handling account records in offices and department stores in their cycle billing operations has been designed by the Rol-Dex Division of the Watson Mfg. Co., Inc. The system evolves around a central work station which houses the customer account file. Open trays hold the account records in Rol-Dex units that are arranged on two sides of a chair-desk assembly that rolls the length of the station. Seated at this chair-desk, the unit operator has complete command of

her station; she can quickly roll her chair-desk to any point in this file; and equipped with a head-set telephone, she can give immediate authorization on any account. This chair-desk and the convenient working level of the trays enable her to remain seated for fast and efficient media filing. The unit operator can continue her work without disturbances from clerks making reference to the 26,000 records from outside the file unit—indexing being printed on both sides. Circle No. 109

## Encoding Check Digit Verifier



A new electronic device—the A570 check digit verifier—substantially reduces the chance of human error in encoding account and other reference numbers into punched paper tape. Introduced by the Burroughs Corp., the verifier is about the size of a portable radio and functions somewhat like a small solid-state computer. The unit is designed to operate cable-connected to Burroughs accounting machines that produce tapes for subsequent data processing. A mathematical computation, which the verifier performs as soon as account numbers are entered into the tape, encodes each number to ensure the accuracy

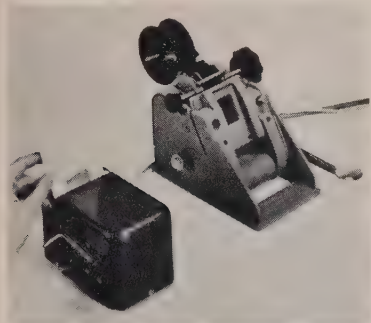
of each entry. The “check digit” is a single digit added to a regular account number. It is determined by using a “double-add-double” calculation addition to the account number. The operator indexes both the customer account number and the check digit into the accounting machine. This data is immediately channeled through the verifier, which performs the double-add-double calculation and subsequent subtraction. If the result of this calculation fails to agree with the check digit, the machine locks and signals the operator that an error has been made, before the account number is punched. Circle No. 106

## Data Input Unit



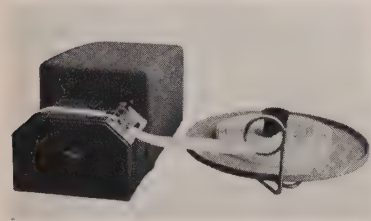
A compact, low-cost, direct-entry data input unit adaptable to all types of systems has been announced by Clary Corp. The compact 10-key keyboard unit can be integrated with any computer or digital instrument, data-logging checkout, testing and other systems. It can be used with both punched paper and magnetic tapes, and with punched cards. It is applicable to remote control operations. The unit can accommodate from five to 30 control keys. Indicator lights are available for special applications. The unit's flexibility is emphasized by the manufacturer. Circle No. 129

## Microfilm Mounting Aid



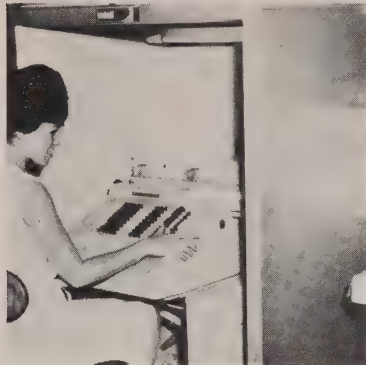
A new device for removing the glassine protective covering from the adhesive edge of aperture cards has been developed by Dataflow, Inc. It is designed to speed the precision mounting of microfilm on aperture cards in automated engineering drawing production systems applications. This method of preparing the microfilm insertion eliminates bending or crimping of the card stock, and avoids damage to the adhesive. Since the stripping operation is mechanical, moisture from the hands doesn't weaken bonding properties of the adhesive edge. With this unit, the aperture card is dropped into slot window side first. The glassine is removed when the operator touches the lever. The card is ready to receive the microfilm image. Circle No. 127

## Portable Tape Unwinder



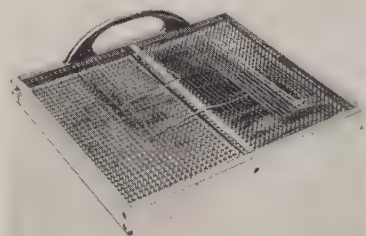
A low cost portable tape unwinder which eliminates manual rewinding of perforated paper tape has been announced by Western Apparatus Division of Comptometer Corp. The 12-inch reel holds up to 1,300 feet of chadless tape or up to 2,000 feet of fully perforated tape. The unwinder feeds the leading end of the tape from the center of the roll into a teletypewriter transmitter. The dimensions of the device are five inches high, 12¼ inches deep (12 inch reel), and it weighs one and one-half pounds. Circle No. 116

## Office Machine Enclosures



Special enclosures to silence noisy office machines are being marketed by Industrial Acoustics Co., Inc. Called "Noishield" Acousti-Closures, these acoustically engineered units are designed to eliminate the noise of such machines as accounting, billing and payroll machine; keypunch, graphotypes, Flexowriters and teletypewriters. The "Noishield" units are available in three series. Series OE and OET are used where the noise source is limited to the top of the enclosure, such as typewriters and table top office machines. Series OEA (shown above) is designed for controlling the noise of floor mounted equipment, such as teletypewriters and sorting machines. Circle No. 126

## Control Panel



A control panel with a permanent terminal post in every hub, ready for wiring and eliminating the need for inserting individual terminals, has been announced by the Clarkson Press Inc., subsidiary of Graphic Controls Corp. Called GC panelLOGICpanel, the panels are completely interchangeable and can be used for different machines by switching templates. Panels are available in single, double or triple sizes for use in various IBM machine types. Circle No. 111

## Copies On Request

*The following booklets, catalogs and brochures are considered of interest to readers of MANAGEMENT AND BUSINESS AUTOMATION. Copies can be obtained by using the Reader Service Card.*

**Magnetic Tab Cards**—A detailed brochure from Business Efficiency Aids, Inc. describes how the Magne-Tab card operates and how it benefits automatic record keeping procedures. Circle No. 140

**Code Converter**—A new booklet from Friden, Inc. highlights the features on the Friden Code Converter which is designed to integrate data processing when two different tape code systems are used. Circle No. 141

**Order-Filling System**—A case history description of an order-picking system utilizing punched cards and pressure sensitive labels is available from the Allen Hollander Company, Inc. Circle No. 142

**Blueprint Storage**—The facts and prices for the Glider line of blueprint racks and storage units is described in a brochure from Momar Industries. Circle No. 143

**Display Devices**—A brochure and chart which details the electro-mechanical characteristics of industrial cathode ray tubes and recording storage tubes is now available from Raytheon Co. Circle No. 144

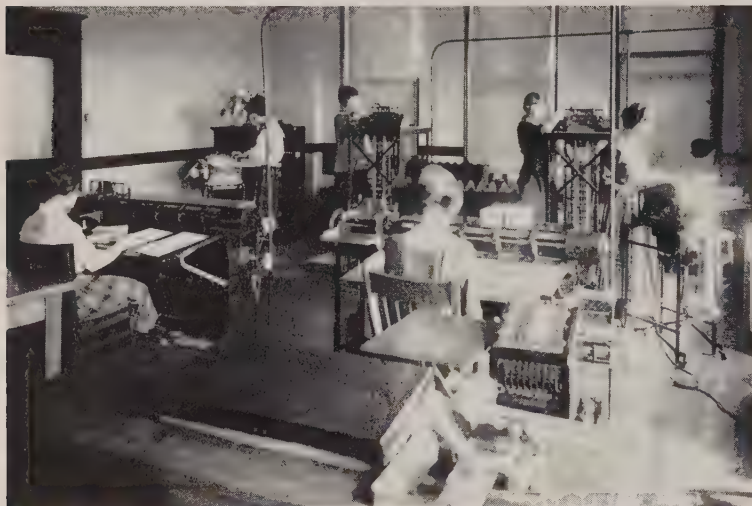
**Two-way Radio**—The General Electric Co. offers a bulletin explaining the operation and features of a new, compact, table model, base station two-way radio system. It serves as a control center for office or plant systems. Circle No. 145

**Dictating Booklet**—"How to Measure Time . . . With Tape," tells users how to get the most out of magnetic tape dictating machines. De Jur-Amsco Corp. describes how to prepare material, compose, and aid transcriptionists. Circle No. 146



# NEWS

## How Many Remember When?



The tab department of the Lincoln National Life Insurance Co. of Fort Wayne, Ind., in the early 1920's. The company was a pioneer user of punched card equipment.



Today the cards have given way to an ultra-modern, tape-oriented IBM 705 system. Some eight million cards have been converted to tape and the information stored on 50 reels. The room has improved a good deal, as well.

The Lincoln National Life Insurance Co. of Fort Wayne, Ind., a pioneer in many forms of life insurance, was a very early user of punched card equipment, and it is now pioneering electronic data processing in Indiana as the first insurance firm in the state to install an EDP system.

Lincoln National is using an

IBM 705 system to process details on nearly a million policies on a daily basis. The system makes all policy calculations including dividends, cash values, reserves and premiums due. It also performs commission calculations and prepares premium notices and commission statements through the use of high-speed printers.

## ITT Sees Worldwide Speed Mail Delivery

With the new electronic Speed Mail system already a functional reality, International Telephone and Telegraph Corp. is aiming at worldwide transmission of mail in a matter of seconds.

The facsimile transmission of letters to and from Washington, D. C., Chicago and Battle Creek, Mich., went into prototype operation on November 1. Intelx Corp., an ITT subsidiary, served as systems manager for the new postal service.

The next big step, according to Dr. Arnold M. Levine, vice president of missile and space programs of ITT Laboratories, is the "relatively simple matter" of linking local electronic mail systems with satellite networks such as the Courier communication system.

With this accomplished, the sender could deposit his letter in a conveniently located "mail box," drop a coin in the box, dial the destination in the manner of a phone call, and have his letter transmitted by satellite to any destination on earth in a matter of seconds.

ITT has developed the ground-based communication network for the present Courier communication satellite. The corporation has also developed plans, such as the END (Earth Net Dial) system, by which groups of "stationary" satellites can relay signals instantly around the earth.

## Royal McBee Reports 77 Computer Orders

At an annual meeting of stockholders of the Royal McBee Corp., Allan A. Ryan, chairman of the board, reported that the company had a backlog of orders for 77 Royal Precision computer systems.

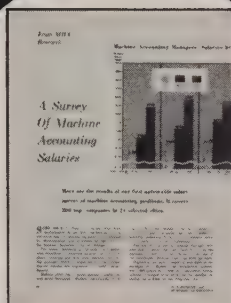
The orders, he said, were for the new RPC-9000 and 4000 systems, as well as for the LGP-30 systems.

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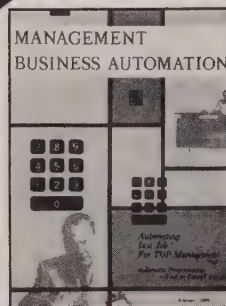
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## OEMI Names Powell As President for '61



Lloyd M. Powell

Members of the Office Equipment Manufacturers Institute elected Lloyd M. Powell, president and chief executive officer of Dictaphone Corp. as OEMI president for the next year.

Mr. Powell succeeds Alfred J. Ball, first vice president of The General Fireproofing Co. as chief executive of the business equipment industry's trade association.

The Institute also named three new members to its board. They are R. S. Laing, vice president of finance, National Cash Register Co.; Walter W. Finke, president of the Electronic Data Processing division of Minneapolis-Honeywell Regulator Co., and Emerson Mead, president and chief executive officer of Smith-Corona Marchant, Inc.

## Collins Radio Enters EDP Service Business

The Collins Radio Co. has formed a Communication and Data Processing division with will provide on-line, real-time data processing service to industry and business.

The company's new Central Data Processing Center in Cedar Rapids, Iowa, will be linked to subscriber stations in Los Angeles, Dallas, Washington, D. C., New York and Kansas City, enabling both large and small businesses to channel information directly into large computers for processing. The first link, to a Toronto, Canada subsidiary, has been opened.

## Computer Speeds Delivery Of Telephone Directories

An electronic data processing system is now being used to increase both accuracy and efficiency in the delivery of 9 million telephone books in New York City and its suburban areas.

The program has started with delivery of the Manhattan "Yellow Pages," and will continue throughout the next year. The Bell Telephone Company is using an RCA 501 to update customer delivery files and enable the directory department to make delivery order changes even after books are rolling off the presses.

When the delivery cycle begins, the computer "asks" its memory for delivery information. This is supplied at the rate of more than 30,000 characters a second and delivery orders are printed out at the rate of 1,200 characters a second. The orders are turned over to the R. H. Donnelley Corp. for handling.

In operation, the system figures out the number of books to go to each district. It takes into account the varying weights of different directories and adjusts the bundles accordingly. The printed order slip tells the delivery men what directories to take to what specific addresses.

## IBM Demonstrates Optical Reader

International Business Machines Corp. demonstrated its new optical reading machine at a special showing for some 200 businessmen in Endicott, N. Y., recently.

The company showed the 1418 character reader linked to the new 1401-C tape system. It was put to work reading numerical data printed with ordinary ink on retail sales checks, insurance premium notices and utility bills—directly into the computer for processing.

W. S. Rohland, program manager of the Character Sensing Development division, stated that the 1418 can read the conventional 407 type (IBM printing font) and this can be made available for conventional typewriters.

## Thin-film Memory — a Major Development



Dr. S. M. Rubens, director of physical research, Remington Rand Univac, shows a sheet of multi-layer printed circuitry used in producing the new thin-film memory planes.

The magnetic film computer memory, a major scientific breakthrough in electronic data processing, was announced by Remington Rand Univac division. (See Product Preview, page 46.)

Univac is utilizing the memory in its new 1107 computer system. It is said to make possible a "third generation" of commercial computers in as much as it offers "much greater capabilities at considerably lower costs for manufacturing, operation and maintenance."

The magnetic film was developed by Univac scientists after seven years of intensive research for a new material and design which would give computers a small, rapid-access internal memory.

The immediate importance of thin-film is highlighted by its ability to be switched in as little as one billionth of a second. In a computer memory this means that information can be stored in and retrieved from the memory with a speed directly related to the speed required for switching the magnetic state of the memory. It is possible, a spokesman pointed out, that the new film memories may ultimately permit a "thousandfold" increase in computer memory speed.

In addition to the high-speed switching time, thin-film memory is of the catalog type which means its store of information can be interrogated and read-out millions of times without destruction, and it requires less electric power for energization than do other memories.

Univac also explained that ferro-magnetic film elements can now be produced which are so small and have such fast switching speeds that they make possible computers of smaller size and much greater capacity than have been available to date.

## Announce Speed Increases for G-20

The Bendix Corp. Computer Division has announced significant increases in speed specifications for the Bendix G-20 computer system as a result of experience with prototype models.

A 40 percent increase in computing speed has been achieved, and the full-word clock cycle time has been reduced to 6 microseconds, the manufacturer announced. Average rate for a single word, fixed point additions, is now 83,000 per second.



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## Hollander Names 29 Winners in Idea Contest

S. Allen Hollander, president of Allen Hollander Co., Inc. recently announced the names of 29 managers and other data processing systems users who presented winning ideas involving the use of pressure-sensitive pin feed labels.

The winners included: Charles Lyons Rhein, data processing manager, Union Free School District No. 22, Farmingdale, N. Y.; Bill D. Morris, systems analyst, The Cooper-Bessemer Corp., Mt. Vernon, Ohio; Joseph A. Carlin, management analyst, Hq. First United States Army, New York City; John H. Steinle, Jr., director of machine accounting, Texas Employment Commission, Austin, Tex.; C. A. Rivers, manager, Blue Cross of Florida, Jacksonville, Fla.; Charles H. Kindswater, manager data processing, W. Atlee Burpee Co., Philadelphia; Charles J. Dougherty, IBM Department supervisor, Krylon, Inc., Norristown, Pa.

Thomas G. Horti, methods analyst, Lockheed Aircraft Service, New York; Bernard B. Snyder, chief of machine accounting, State of Maryland Department of Employment Security, Baltimore; Richard E. Deering, payroll supervisor, Western Electric Co., New York City; Carl J. Hinson, systems designer, Chesapeake & Ohio Railway Co., Richmond, Va.; Eugene Kelley, field captain, Nestle Company, White Plains, N. Y.; Raymond Dreyfack, director of tabulating systems, Faberge Perfumes, Ridgefield, N. J.

Edward R. Drohan, IBM supervisor, Stop & Shop, Inc., South Boston; John V. Gino, industrial engineer, Ford Division, Ford Motor Co., Dearborn Mich.; Geoffrey H. Botton, manager of machine accounting, General Film Laboratories, Hollywood, Calif.; B. W. Taylor, supervisor, Sun Oil Co., Dallas; Abram Bart, industrial engineer, C.I.T. Financial Corp., New York City; Ervin Pick, manager, Mutual Life Insurance Co., Chicago.

John R. Schjelderup, IBM supervisor, Don W. Snyder Co., Los Angeles; Albert J. Ford, systems analyst, Allied Chemical Corp., New York City; Ernest W. Hatcher, manager, EDP department, John Hancock Mutual Life Insurance Co., Boston; M. L. Schwartz, vice presi-

dent, EIS Automotive Corp., Middletown, Conn.; John B. Murray, plant accountant, Price Brothers Co., Dayton, Ohio; Thomas J. King, systems planner, Bourns, Inc., Riverside, Calif.; Charles L. Hunter, methods supervisor, Western Electric Co., New York City; John H. Krenkel, tabulating supervisor, Lever Brothers Co., New York City; John A. Girdzie, supervisor of data processing, Bridgeport Brass Co., Bridgeport, Conn.; and William A. Vensel, systems supervisor, International Harvester Co., East Moline, Ill.

## Records Group Joins V-C Congress



William Benedon

The American Records Management Association, meeting in Milwaukee recently, approved a move for the group to join with the Society of Reproduction Engineers and the American Institute for Design and Drafting to sponsor the 1961 Visual Communications Conference, scheduled for Los Angeles.

The ARMA delegates elected William Benedon, Lockheed Aircraft Corp., as their new president. Other officers include: Dale S. Kuebler, Photo Devices, Inc., executive vice president; Mrs. John S. Killelea, The General Fireproofing Co., eastern vice president; Miss Alma K. Ledig, Shaw-Walker Co., central vice president; William E. Haughn, Standard Oil Co., western vice president; W. H. Topham, Pacific Telephone and Telegraph, treasurer; Donald A. Schauer, Office Methods and Procedures, secretary, and George M. Derry, Richfield Oil Corp., executive secretary.

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*Published by*  
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*Edited by*  
**Philip H. Weber, noted authority  
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8. Analysis of Evaluation Chart for Developing a Schedule of Position Grades with Salary Ranges
9. Comparison Charts for Checking Over-all Evaluation Structure
10. Position Grade and Salary Range Record Sheets for Recording Classification of Employes
11. Procedure for the Calculation Steps Within Each Salary Range
12. Policies and Procedures for Administering the Evaluation Program
13. Area and Industry Supplemental Data

**Here are the specific subjects covered in the manual:**

1. Introduction to Basic Problems in Determining Salaries
2. Procedures for Establishing a Position Evaluation Program
3. Position Description Forms for Classifying Positions
4. Rating Scale Used for Determining the Point Values of the Standard Positions
5. Summary of Point Ratings for Checking Relative Rank of the Standard Positions

**About the author**

Philip H. Weber heads his own company specializing in compensation plans. Formerly with Business Research Corp., vice-president in charge of all client work in personnel field. Established evaluation plans for such companies as Cincinnati Milling Machine Co., Olin Mathieson Chemical Corp., The Northern Trust Co., Detroit Edison Co., United Air Lines, Inc., Lone Star Cement Corp., Admiral Corporation, Armour and Co., and Weyerhaeuser Timber Co. Served as president of Industrial Management Society. Frequent speaker and writer on wage and salary administration problems. Directed MBA's first nationwide study of machine accounting salaries in 1959.

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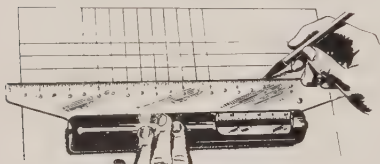
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## MBA Reviews

### Proceedings of the 1959 Computer Applications Symposium

*Published by Armour Research  
Foundation of Illinois Institute of  
Technology, MF:CA6, 10 West 35th  
St., Chicago 16. \$3.00*

Sixth in the annual Computer Applications Symposia, the 1959 meeting had, on the first day of its sessions, papers devoted to business and management applications. These valuable, published "Proceedings" represent a significant addition to the literature of computer applications.

Among the applications discussed are: A.T.&T.'s "Shareholder Record-Handling with the Aid of Character-Recognition Equipment," by J. M. Wells; the operations of the U. S. Air Force Aeronautical Chart and Information Center, "Around the World in Eighty Columns," by W. E. Hanna, Jr.; "Cost Reduction Through Integrated Data Processing" at Bendix Missile Div., by R. F. Hamaker; and A. C. Nielsen Co.'s "Experience and Plans for Marketing-Research Operations," by R. B. Wilson.

"Some Aspects of Computer Technology in the U.S.S.R." are reviewed by S. N. Alexander in these "Proceedings." The panel discussion for the business and management applications session is reported as well as other varied applications and discussions which are included.

### Handbook on Data Processing Methods

*Published by the Columbia University Press, 2960 Broadway, New York 27. \$1.00.*

Prepared jointly by the Statistical Office of the U. N. in New York and the Statistics Div., Food and Agriculture Organization of the U. N., Rome, this handbook is a simple, but very thorough, aid to meeting the difficulties which many countries and companies experience in processing statistical data. It is based on a group of studies conducted by the U. N. in order to pro-

vide more information in the data processing field.

Studies reported in Part I, Provisional Edition, include: Scope and Principle Methods of Data Processing; Planning, Organizing and Administering Data Processing Services; The Elements of Planning and Operating a Punch-Card Installation; Manual Methods and Tools for Data Processing; and Punch-Card Sorting.

The demand for information in this field has stimulated the publication of the Provisional Edition.

### Lessons Learned From the Pentagon Fire and Installation Requirements For Transistor Machines

*Published by Canning, Sisson and Associates, Inc., 1140 South Robertson Blvd., Los Angeles 35. \$10.00.*

Excellent fire protection and installation data with regards to data processing systems is contained in this supplemental report to the publisher's earlier publication, "Cutting the Cost of Your EDP Installation." This report is sent free with the initial service.

"Lessons learned in the Pentagon Fire" can be used to advantage in every EDP installation. It includes a talk by Col. Harry W. Roberts giving a vivid eye-witness description of the Pentagon catastrophe. This is probably the most thorough report of what happened and how it could have been prevented.

A supplement to this report is a memo from RCA regarding "Equipment Fire Protection and Tape Combustion Factors," and states their recommendation of EDP fire protection.

The other part of the report, "Installation Requirements of Transistor Machines," states the advantages of such computers and points out case histories in cost savings for the Marine Corps, Niagara Mohawk Power Corp., Fidelity-Philadelphia Trust, S. C. Johnson & Son, Inc., and State Farm Life Insurance Co., with a chart comparing installations in organizations.

# MBA's Calendar

**January 16-19**—The Instrument Society of America's Winter Instrument-Automation Conference (Sheraton-Jefferson Hotel) and Exhibition (Kiel Auditorium) in St. Louis, Mo. For Information: William H. Kushnick, Executive Director, ISA, 313 Sixth Ave., Pittsburgh 22, Pa.

**February 1-3**—The Second Winter Military Electronics Convention (MIL-E-CON) sponsored by the National Professional Group on Military Electronics and the Los Angeles Section, Institute of Radio Engineers. Write: IRE Business Office, 1435 S. La Cienega Blvd., Los Angeles 35, Calif.

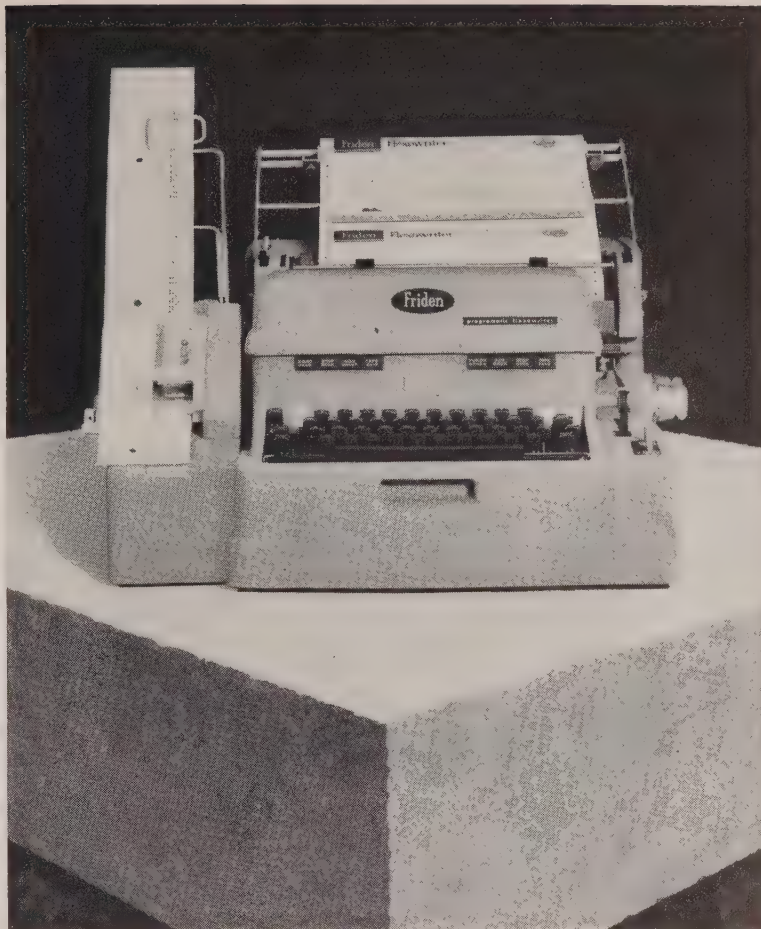
**February 13-16**—Third Institute on Information Storage and Retrieval, at the American University, Washington, D. C. Theme: Machine Indexing. For more information contact: Prof. Lowell Hattery, Dir., Center for Technology and Administration, The American University, 1901 F. St., N. W., Washington 6, D. C.

**February 27-March 2**—Midwest Seminar and Business Show of the Office Managers Association of Chicago, Conrad Hilton Hotel, Chicago. Write: OMAC, 105 W. Madison, Chicago, Ill.

**March 6-8**—The first comprehensive American Management Association Data Processing Conference, Statler Hilton Hotel, New York. AMA's seventh annual exhibit will be held in conjunction. AMA, 1515 Broadway, New York 36, N. Y.

**April 4-6**—10th Annual Meeting and Convention of the National Microfilm Association at the Sherman Hotel in Chicago. Write: Vernon D. Tate, ex. sec., NMA, Box 386, Annapolis, Md.

**April 17-21**—The Business Equipment Exposition, third major equipment show sponsored by the Office Equipment Manufacturers Exhibits, Inc., at New York Coliseum. Write OEME Headquarters: 777 14th St., N. W. Washington 5, D. C.



## Automation Cornerstone

The Friden Flexowriter® has three basic capabilities: 1) It can type. 2) it can *record* what is typed on punched paper tape, 3) it can *read* tape back to itself, retyping automatically at 100 words per minute.

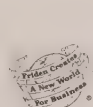
These things are remarkable enough, but the important point is this: Tapes produced on the Flexowriter can automatically control a great variety of other machines—those made by other manufacturers as well as by Friden. Thus the Flexowriter performs the key task in automation, *translating human language into a language that machines understand.*

Applications for the Flexowriter are immensely varied. It allows man to converse with computers. It prepares tapes that control automated machine tools. It's also bringing about a major revolution in the handling of basic business paperwork. And the surface is only scratched.

It will pay you to learn more about this machine and the jobs it could be doing for you. Your local Friden Systems Representative is the man to see. Or write: Friden, Inc., San Leandro, California.

*THIS IS PRACTIMATION: automation so hand-in-hand with practicality there can be no other word for it.*

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SALES, SERVICE AND INSTRUCTION  
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- 22 **A Hard Look at Efficiency Experts,** by C. Northcote Parkinson. A humorous essay with a serious message about the new and "superfluous" profession, management consulting.
- 26 **An Intercom System Breaks Telephone Traffic Jam.** Lufthansa German Airlines modernize their internal communications system to facilitate more efficient flight reservations operations.
- 28 **Administrative Systems—A Management Necessity,** by D. A. McGee. The history of a successful systems and procedures application in a large company is described by president of Kerr-McGee Oil Industries, Inc.
- 34 **Personalized IDP for Small Business.** Transport Clearings of Metropolitan New York, Inc., expedites payments to member carriers of freight bills due from shippers and receivers.

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- 22 **Teaching Management How to Manage.** Inside look at an American Management Association EDP forum from planning stage to conclusion, showing the AMA in action.
- 28 **From Punched Card to Printed Page.** Weaver Organization produces error-free catalogs, brochures and directories using typed punched cards as camera input, which makes film for the offset printing master.
- 30 **Operations Research—What, Why, Where and How,** by R. Hunt Brown. This form of scientific management is explained in language everyone can understand and its use in solving business problems is shown.

## September, 1960

- 22 **Optical Scanning—An Unlimited Horizon,** by Arnold E. Keller. The first history and roundup of optical scanning devices explaining the new look in EDP systems and an economical solution to input bottleneck.
- 30 **The Government Evaluates Its Data Processing Progress,** by John A. Beckett. Assistant Director of the Bureau of the Budget highlights the pitfalls and progress of 10 years of ADP in government, and the lessons learned.
- 36 **Records Get A Lift from Esso Standard.** The Baton Rouge Refinery utilizes "palletized" storage and a fork-lift truck as a mechanical "file clerk" to show an interesting solution to an old problem.
- 40 **The Consolidated Functions Approach.** Management at Minnesota Mutual Life Insurance Co. spent six years investigating and planning a working EDP system which has been successfully applied to a group of paper-work operations at a savings of almost \$100,000 a year!

## October, 1960

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- 24 **Business Office Sets Fast Pace for 'Space-Age' Hospital.** Memorial Hospital in Long Beach, Calif., has combined many electronic achievements in the successful management and operation of this institution.
- 30 **Microfilm at Redstone—the Key to Engineering Communications.** U. S. Army Rocket and Guided Missiles Agency at Redstone Arsenal designs and maintains missiles with up-to-date microfilm information.
- 40 **Automation Adds the Personal Touch to an Order-Taking Routine.** Mechanics, Inc., world's largest distributor of Formica, utilizes a spinning rotary file to a personalized, one-step order-inventory system.

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- 18 **Jonker's Approach to Information Retrieval.** In an interview, Frederick Jonker, president of Jonker Business Machines, explains a simple, inexpensive method of information retrieval called "Termatrex."
- 28 **Basic Elements of Computer Environment.** A floor-to-ceiling picture of the requirements for a smoothly functioning electronic data processing installation shows that computer environment is a job for experts.
- 34 **A Happy Holiday—Thanks to Automation.** First Trenton National Bank uses a new type of check to facilitate fast issuance of Christmas Club checks.
- 36 **An Electronic First at First Pennsylvania.** First Pennsylvania Banking and Trust Co. operates the first, fully-automatic, electronic bank bookkeeping system in the world, using MICR and a magnetic tape computer.
- 40 **Integrated Time and Tab Cards Speed Job Costing.** Actual time to complete a job, for payroll and job cost information, is determined by an elapsed time computer and data processing at Electro Dynamic Div.

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- 24 **Atlantic City's 'Showcase for Service,'** by Robert W. Hogg. The treasurer of Atlantic City Electric Co. explains how a computer and optical scanning is utilized in a new EDP-Accounting center.
- 30 **New System Integrates Shell Oil Management Data,** by J. W. Haslett and P. A. Kalb. Shell Oil Co.'s desk-size computers capture point-of-sale data for management information.
- 36 **Survey of Business Machines Executives' Compensation,** by D. Ronald Daniel. This second survey, reported by MBA, includes a six year and all industry comparison of business machines executives rising salaries.

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# EDITORIAL

## **"Socialized Automation?"**

In a recent interview appearing in the New York Times, Mr. John Diebold, one of the more vocal members of the management consulting profession, predicted that a "really complete" study of American automation will be undertaken by the Kennedy administration this spring. Mr. Diebold based this forecast on private conversations with some of the President-elect's advisors.

The prediction is a disturbing one, for it gives indication that Mr. Diebold has found a ready ear, and perhaps a client, for a program that involves Federal intervention in an area that needs no government interference.

We assume that Mr. Diebold's program is similar to the one he proposed before the Subcommittee on Automation and Energy Resources of the Joint Economic Committee last August. At that time he advocated government action to formulate a national policy to effectively "stimulate automation by creating an environment that encourages a speed-up in the business use of this new technology." The national policy, he told the committee, must be aimed at creating an environment that is "receptive to change." In his opinion, the nation cannot sustain a high rate of technological advance without coping with these problems and "we simply cannot wait for evolutionary forces to solve our internal problems."

The specifics of Mr. Diebold's program contain some interesting financial paradoxes, such as "an enlightened tax policy aimed at encouraging business innovation," and "Federal stimulation of new business through fiscal policy."

There are, and will continue to be, many problems associated with the advancement of automation in American industry. But there are problems associated with any aspect of progress. These problems, historically, have been best solved by continuing programs of education on the part of business, and cooperative arrangements between labor and management.

To invite governmental participation in the solution is to accomplish nothing more than the establishment of another bureaucratic agency—a certain guarantee that the agency, and the problems, will become permanent conditions.

We find Mr. Diebold's proposal to be somewhat a blueprint for "Socialized Automation." Hopefully, the program was designed to attract publicity rather than action. Whatever the reason, any suggestion of government interference in an industry, that under its own guidance has already become one of the most progressive influences in American economy, should be rejected.





**RCA** *announces...*

## A New Direction in Lease Plans for Electronic Data Processing Equipment

RCA now offers a choice of *four* new lease plans that permit you to rent RCA Electronic Data Processing Equipment, and all the guidance and service that goes with it, *on a basis geared to your own particular usage requirements*. This major departure from customary leasing practice is another RCA innovation... an indication of RCA's responsiveness to the customer's needs.

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➔ **IF YOU REQUIRE ONLY EIGHT HOURS A DAY OF COMPUTING TIME**, RCA offers you a contract at a rental which fits your situation precisely... and you may designate the shift you wish to operate.

➔ **FOR MAXIMUM ADAPTABILITY TO WORK SCHEDULES**, the Random Use Contract allows you to schedule EDP operations at periods most convenient to you. A total of 200 hours of basic use-time per month is included in the charges.

➔ **FOR EXTENDED USE**, where you require up to three full shifts, a basic monthly charge is made. The period covered in the contract is 24 hours a day for a 5 day week and the operating period can be enlarged to provide you with up to 16 additional hours per day for the 2 remaining days.

➔ **WHEN YOUR COMPUTER REQUIREMENTS GROW TO THE LEVEL OF THREE-SHIFT DAILY AND WEEKEND USE**, RCA's Unlimited Availability Contract may be utilized to provide all this service for a basic monthly charge. Use the equipment as much as you want!

### RCA RELIABILITY... PROTECTS EQUIPMENT PERFORMANCE

Because of the high degree of reliability built into each RCA EDP System, all of the above lease agreements include primary shift maintenance of the equipment. Since RCA's Electronic Data Processing Systems have this unique built-in reliability, maintenance and service are kept to a minimum, you receive the advantage of a more attractive rate. Maintenance service beyond the primary shift is available at a flat rate per man-hour, as needed.

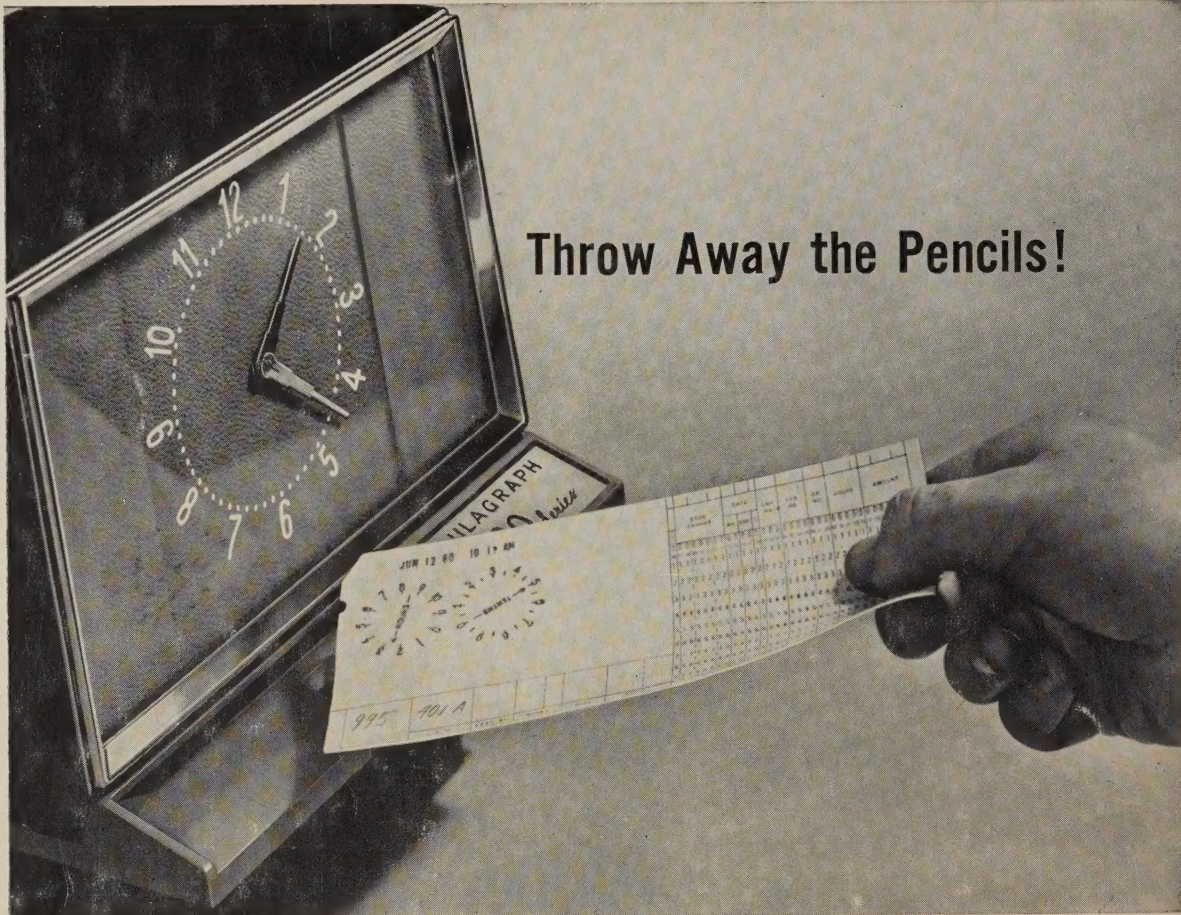
Take advantage of RCA's new contract arrangements to keep your paperwork at a minimum, your EDP quality at a maximum! For full details and rates, write Electronic Data Processing Division, Radio Corporation of America, Camden 2, N.J.



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## **Calculagraph 500 Series automatically computes actual labor time — eliminates error-ridden manual methods.**

Your data collection system can be greatly simplified and attain greater accuracy with the new 500 Series Calculagraph because this completely new computing time recorder, based on the time-tested Calculagraph principle, computes as well as prints the actual time worked on any given production job. There are no complicated levers or buttons to set. The 500 Series makes the decisions. Production workers merely insert job cards at the "start" and "finish" of the job. The 500 Series does the rest. The actual time worked, with

nonworking periods automatically deducted, is printed on the job card and ready for processing.

The 500 Series dovetails easily with any internal data processing system or outside service center. In smaller systems where the volume does not justify the use of machine accounting, this new computing time recorder can be a system in itself.

Investigate this new 500 Series now. Write or call for more details and, if possible, send us samples of your job cards for analysis.

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